

EFFECTS OF A SIMULATION GAME ON TRAINEES' KNOWLEDGE AND
ATTITUDES ABOUT AGE-RELATED CHANGES IN LEARNING AND WORK
BEHAVIORS OF OLDER WORKERS

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This investigation was conducted in response to the need for effective diversity awareness programs to help employers create intergenerational-friendly work environments. An experimental pre- and post-test control group randomized block design was employed to answer two research questions about the effects of a simulation game on knowledge and attitudes about age-related changes in learning and work behaviors of older workers. Participants were assessed immediately prior to and following the treatment, followed by a third assessment 60 days later. Necessary measures were taken to control for threats to the study's internal validity. An applicant pool comprised of human resource management and development practitioners and senior undergraduate students enrolled in human resource management courses yielded a sample of 65 participants. Chapter one introduces the study. Chapter two provides a review and summary of relevant literature on ageism in the workplace, training older workers, and simulation games. Chapter three describes the procedures and methods used to answer the research questions. Chapter four presents the results of all analytic procedures related to the investigation. Chapter five provides the conclusions and recommendations based on the findings of this investigation. In this investigation, the treatment group did not score significantly higher on their knowledge of age-related changes in learning and work

behaviors of older workers than the control group following treatment. The attitudinal change experienced by the treatment group did not differ significantly from the attitudinal change experienced by the control group. Recommendations for further research include the following: (a) the disordinal interactive effect of the control group's performance on the knowledge measure during the 60-day interval between post assessments warrants further investigation, (b) the statistically significant change in attitude that occurred *within* each group during the 60-day interval following treatment warrants further investigation, and (c) more reliable instruments need to be developed for measuring the effects of heightened awareness following diversity interventions.

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CHAPTER 1

INTRODUCTION

Background

Two profound transformations in the American workplace are converging to create a phenomenon that could seriously threaten U.S. economic stability in the 21st century (Adamchak, 1993; Fyock, 1991; Goddard, 1987; Lerman & Schmidt, 1999; Quinn, 1993; Steuerle, 1996; Stokes, 1999; Wallace, 1999). In response to rapid changes in the global marketplace, America is restructuring the way it works at the same time that today's workers are (a) aging dramatically (D.A. Peterson & Wendt, 1995; Hall & Mirvis, 1994; Kochan, 1996; Wallace, 1999), and (b) the skilled labor supply is shrinking. Hube (1999) noted that according to the American Management Association, 50% of employers said two years ago that skilled labor was scarce. This year, 66% said it was scarce, and 70% anticipated it would be scarce through 2002 ([On-line]. Available: <http://public.wsj.com/careers/resources/documents/19991215-hube.htm>).

The maturing U.S. labor force will create a historically unique situation when the largest group of potential workers enters late career stages at the beginning of the 21st century (Deets, 1999; Fullerton, 1997; Kochan, 1996; London & Greller, 1991).

By 2025 at the latest, the proportion of all Americans who are elderly will be the same as the proportion in Florida today. When we consider the great demographic shift that will shape the American future, we are speaking not of a mere transition but of a genuine transformation. (P.G. Peterson, 1997, p.140)

A 1985 study conducted by the American Association of Retired Persons (AARP) identified five developments in business that are changing the way Americans work:

1. American Business has been faced with unrelenting downward pressure on profits for a prolonged period.
2. Success strategies to cope with declining profitability have been and continue to be built on cost cutting.
3. Even in the face of downsizing, business has created new jobs but there is a growing division in the workplace between service and knowledge jobs.
4. The mood of business, indeed of all Americans, has come to stress bottom-line thinking and pragmatic attitudes.
5. Traditional corporate paternalism has given way to a corporate culture of expendability. (AARP, 1995, p.1)

As recently as 1995, the U.S. General Accounting Office (GAO) published findings of a study involving 17 private companies, five states, and three foreign governments. The GAO found that the private companies' decisions to downsize resulted from "restructuring based on strategic planning designed to shape and guide the companies' future directions" (U.S. General Accounting Office, 1995, p. 5).

Over the past 40 years, the United States has experienced significant changes in the workforce participation of its older adults. In 1950, 87% of males and 27% of females aged 55-64 were working (Sterns & Miklos, 1995, p. 249). In 1960 the median age of the labor force was 40.5 years. By 1970, this average had dropped to 39 and

continued dropping to 34.7 years in 1980. However, by 1985 it had risen to 35.2 years (London & Greller, 1991, p. 126). By 1990, 65% of males and 42% females between the ages of 55 and 64 were working (Sterns & Miklos, 1995, p. 249).

Kochan (1996) wrote,

The images that best characterize the American Corporation as an employer in the 1950s are ones of stability and uniformity, shared gains among multiple stakeholders, and model for the rest of the world. By the 1990's, however, these images were replaced by ones of transformation and change, workforce diversity, efforts to de-emphasize hierarchy in organizational designs, and a serious questioning of how to adapt the management and labor practices of competitors from abroad. (p. 244-245)

The U.S. Bureau of Census has attributed this demographic fluctuation to the baby boomers cohort, (i.e., the 43 million babies born between 1946 and 1964 following World War II). Sonnenfeld (1996) explained the cohort effects of the baby boom on the population:

A middle-aged bulge is forming and eventually the 35-to-45 year old age group will be crossing the infamous bridge to 65, increasing the relative size of that population from 12% of all Americans to 17% - a jump from 31 million to 52 million. (p.180)

The cohort effects of working baby boomers could have a dramatic impact on the structure of retirement. Boomers currently comprise 52 % of the working age population. Twenty-three percent are between the ages of 47 and 51. Out of every 100 boomers who reach 65, around 75% will still have to work, 23 % will depend on others, and 2% will be self-sufficient (Caudron, 1997).

In 1991, Louis Harris and Associates documented the contributions of Americans 55 and older in the Commonwealth Fund Productive Aging Survey. At that time, “three out of four older Americans, some 38 million people, [were] actively engaged in contributing to society by working, volunteering, caring for sick or disabled family and friends, or helping their children or grandchildren” (Davis, 1995, p.vii). Of the 38 million older Americans reported to be actively contributing to society, 14.3 million of these older Americans worked. This number represented 27% of the working age population at that time (Barth, McNaught, & Rizzi, 1995). Current projections for the year 2005 indicate that Americans 55 or older will represent 30% of the working-age population. This proportion will increase to 40% by the year 2020 (Hall & Mirvis, 1994).

The demographic changes and increasing “chronological diversity,” or age-distribution, of the working-age population are having dramatic effects on the “mobility, flexibility, and energy” of the American workplace (Sonnenfeld, 1996). However, potential changes in the workplace environment (i.e., improved workplace conditions, unabated inflationary pressures, and insufficient employee retirement benefits) could dramatically affect the “participation/retirement mix across all occupations” (Doering, Rhodes, & Schuster, 1983).

Younger workers, recognizing that they will be in their ‘golden years’ in the coming decades, also worry about the shrinking size of the workforce relative to older individuals. Their primary concern is that the workforce will not be large enough to sustain the fiscal viability of the nation’s Social Security system. By the beginning of the 1990s, there were only 3.4 workers for every retiree, down considerably from 40 in 1935. There will be even fewer by the middle of the next century (1.9 workers for every retiree). (MacManus, 1997, p. 115)

Environmental change external to the workplace can also affect the workforce participation/retirement mix. The increase in longevity made possible by advances in medical science and healthcare is a primary example. People born in 1998 could live 102 years, a life span that would enable them to see the 22nd century. Without changes in current law, people born in 1998 would be able to retire at age 62 and be entitled to receive 40 years of benefits (The Urban Institute, 1998). People born in 1998 would not be eligible to benefit from social security until the year 2060. Many Americans are concerned that the institution of retirement will no longer be valued in 2060. In a recent poll, AARP and the National Council on the Aging found that “the closer [today’s] workers get to retirement age, the more they want to keep working, and that 40% of [currently] retired people would rather be working” (Dychtwald, 1990, p. 175). If left unchanged, social security is an example of a societal structure that will diminish in value for future cohorts. This predictable “mismatch between people and structures” is what Riley, Kahn and Foner (1994) defined as structural lag.

In society at large, lives have been drastically altered over this century – as a consequence of increased longevity, advances in science and education, the gender revolution, improvements in public health, and other historical trends and events – but numerous inflexible social structures, roles, and norms have lagged behind. There is a mismatch or imbalance between the transformation of the aging process from birth to death and the role of opportunities, or places in the social structure, that could foster and reward people at the various stages of their lives. (p.16)

Structural lag is a phenomenon that human resource managers and developers cannot afford to ignore.

The current anxiety is compounded by the realization that many of the social and economic institutions that sustain us during our working lives, and that provide for our retirement appear to be out of date. In order to adapt successfully to economic change, we need to rethink and rework the public and private strategies that affect a job market in transition. (Research and Policy Committee of the Committee for Economic Development, 1996, page vii)

Current trends and changes in vocational behavior over the past 20 years (Caudron, 1997; Gaullier, 1990; London & Greller, 1991; ThirdAge News & Opinion, 1998) indicate that older workers will want to keep working past retirement age. Demographic change will shape human resource needs in 21st century organizations. According to Wallace (1999), “Nowhere will the agequake strike harder than in the workplace. Yet nowhere seems less prepared for the challenge (p. 129). In 2000, the average workers will be nearly 40 years old, compared with 36 in 1990 (U.S. Congress Office of Technology Assessment, 1990, p. 3).

Keeping the aging U.S. labor force from becoming obsolete as business environments and work processes change will require ongoing training (D.A. Peterson & Wendt, 1995; Research and Policy Committee of the Committee for Economic Development, 1996). According to Wallace (1999), “there will be an explosion in retraining and relearning in the next 15 years to rekit aging workers with the new skills they need” (p. 147). To prepare effectively for this future explosion, human resource developers are faced with reexamining their training methods and learning environments. As workers grow older, their learning styles and modalities change to accommodate the effects of age (Caffarella & Barnett, 1994; Mintz, 1986). Mid-20th-century training theories have little appeal for a “new and varied population” (Mintz, 1986, p. 70).

Training and development structures cannot remain static (D.A. Peterson & Wendt, 1995).

The traditional methods of teaching based on exposition and presentation of theory followed by later application may work well with younger people, but it appears that these methods which are refined slowly through school life do not survive as natural and easy ways of learning once the individual has long left behind his school room experience. (Barkin, 1970, p. 18)

Presently, there is considerable evidence of a serious lag in job training for older workers in the industrialized world (Baldi, 1997; Dixon, 1990; Doering et al., 1983; Hassell & Perrewew, 1995; London & Greller, 1991; Nusberg, 1990; Palmore, 1990; Phillips, 1991; Research Committee for the Committee on Economic Development, 1999; Rosen & Jerden, 1976; Saxon & Spitznagel, 1991; Schaie, 1988; Sheppard, 1970; Sparrow, 1986; Sterns, Barrett, Czaja, & Barr, 1994; Zeplin, Sills & Heath, 1987). According to Useem (1997), a “1991 survey of 406 companies confirmed the same. Three in ten companies reported substantial investments in the training of workers aged fifty or younger while fewer than two in ten so spent on those over fifty” (p. 314).

Fewer than 1% of America’s employers have policies or related training solutions for older workers who want to continue working with reduced hours and benefits (Taylor, 1989). Even programs initiated under the Older Americans and Job Training Partnership Acts that have successfully placed older workers in jobs offer no incentives to firms for training their older employees (U.S. Congress, Office of Technology Assessment, 1990).

Why is there such a gap in job training for older workers in the industrialized world? What factors are contributing to the mismatch between people and structures? One possible explanation involves the effects of “age norms” on a wide-range of employment issues and organizational policies (Cleveland & Hollman, 1990; J.A. Lee & Clemons, 1985; Kanter, 1977; Kimmel, 1988; Krueger, Heckhausen, & Hundertmark, 1995; Lawrence, 1988; Rosen & Jerdee, 1976; Sterns & Miklos, 1995; Zeplin et al., 1987).

Chronological age is one of the few universal human experiences and as a result provides a basic structural link between individuals and social systems. People use age to classify the members of a social system into categories and to match them with roles and statuses. The matching process between age categories and roles and statuses produces widely shared beliefs about the standard or typical ages of members holding each social position. (Lawrence, 1988, p. 310)

Chronological age is a frequently used benchmark for determining how and where individuals in society belong. However, for older employees there are several problems associated with the use of chronological age in the workplace. One problem is that other types of age are often overlooked or ignored. For example, in one British pilot study, researchers found a reliable predictor of attitudes toward older workers. The predictor was the age of the employer organization (Slater & Kingsley, 1976). Favorable attitudes toward older employees occurred more frequently in older organizations. Other ages associated with, but not identical to chronological age, are biological and social age (Sterns & Miklos, 1995); psychological age (Sparrow, 1986; Sterns & Miklos, 1995); and functional age (Berkowitz, 1988; Czaja, 1995). Cleveland, Shore, and Murphy (1997) suggested that a worker’s chronological age affects various work-related variables (e.g.,

retirement), but does not “fully reflect meanings that individuals associate with age” (p. 240). For this reason, chronological measures have limited utility.

Another possible explanation involves the arbitrary definition of “older worker.” At what age does a worker become old? Tuckman and Lorge (1953) posed this question to four groups who differed in age, education, occupation and socio-economic status. Responses ranged in age from 15 to 85 years. These findings support the premise that for over 40 years, chronological age has been considered a poor yardstick for determining when a worker becomes old because of the many differences among individuals.

If science agrees on anything, it is that older people are heterogeneous. This may explain why the term “older worker” keeps being redefined. Although many statistics refer to ages ranging from 55 to 64, the law defines an older worker as anyone 40 and older. The arbitrariness of these definitions illustrates what a slippery task it is to define what is “old.” (Carnevale & Stone, 1994, pp. 96-97)

Even today, the age at which a worker is considered old is largely a function of the criteria used. Examples of these criteria are the Age Discrimination in Employment Act (Czaja, 1995, p. 48) and participation rate (Kaminski, 1983), which uses 50 as the age at which workers become old.

Age-earnings profiles show that workers in the developed world generally hit peak earnings at around 50. The standard interpretation of this pattern is that individual productivity generally declines in one's fifties. Employers say this is a key reason for their reluctance to employ and recruit older workers. Retraining could overcome this problem, but companies then worry that they cannot recoup the cost with older people who are not expected to stay as long as younger employees. (Wallace, 1999, p.140)

The problem investigated in this study pertains to the effects of age norms on organizational “mindsets” (E. J. Langer, 1989, 1997). Findings from a management study of socially-generated age effects in an electric utility company suggest it is the “shared beliefs” of employees about the effects of aging that produce age norms for an organization. The norms directly and often adversely affect “managerial behavior toward the older employee” (Hale, 1990, p. 6). According to Steinhauser (1998), “Negative stereotypes are so pervasive, in fact, that some boomers admit to grappling with prejudices about older workers when making hiring and personal decisions” ([On-line]. Available: <http://www.shrm.org/hrmagazine/articles0798cov.htm>).

In another study using simulated employment decisions (Hale, 1990), researchers found that managers made favorable decisions about mature employees when (a) the choice was not between an older and a younger worker, and (b) objective performance information about the older employee was made available to the decision maker. If the manager did not have to make a “knowingly age-biased choice, she tended to make a more positive judgment about the older worker” (p. 6).

Decisions made about workers based on age alone are known as “age-biased” decisions. Decisions that systematically stereotype and discriminate against workers because of their age are known as “ageist” decisions. Ageism, a term originally coined by Butler in 1968, allows the younger generation to see older people “as different from themselves; thus they subtly cease to identify with their elders as human beings” (Butler, 1993, p. 75).

However, some studies indicate that not all employers share ageist beliefs about older workers (Barkin, 1970; Bove, 1987; Brubaker & Powers, 1976; Carnevale & Stone, 1994; Clark, 1994; Czaja, 1995; Driver, 1994; Galagin & Cummins, 1993). Among contemporary companies that have successfully developed intergenerational-friendly workplaces, Zemke, Raines, & Filipczak (2000) listed (a) Chevys Fresh Max, (b) TGI Friday's, (c) Ben & Jerry's Homemade, Inc., (d) West Group, and (e) Lucent Technologies (pp.156-159).

The presence of ageist and non-ageist studies in the literature creates an interesting paradox. For example, in a study of age, skill, and management, researchers found that almost all organizations and communities "appoint individuals aged about fifty-five years as their policy makers and leaders" (Singleton, 1983, p.15). This finding begs the question: If older employees are not valued, then why do we place them in leadership roles? Another question is, Are negative attitudes toward older adults a function of the aging process or of the perceptions of generations? (Slotterback, 1996).

A number of researchers have investigated possible answers to these questions. Studies about attitudes and mindsets (Allport, 1958; Katz, 1990b; Langer 1989, 1997; Rosencranz & McNevin, 1969; Thorson & Perkins, 1981; Tuckman & Lorge, 1953, 1958), and studies about the effectiveness of diversity programs (Delatte & Baytos, 1993; Gunsch, 1993; Rossett & Bickham, 1994) yield an important clue. Findings from these studies suggest that stereotypical beliefs and counterproductive attitudes toward older workers can be changed. However, additional research is needed to determine how to

change these attitudes and “produce personnel policies more sympathetic to older workers” (Murrell, 1970, p.82).

Purpose of the Study

The purpose of this study was to examine the effects of a simulation game on trainees’ knowledge and attitudes about the age-related changes in the learning and work behaviors of older workers. It was conducted in response to the need for effective diversity awareness programs to help employers create intergenerational-friendly work environments (Zemke, 1984, p. 75). This study has important implications for practitioners in both Human Resource Management and Human Resource Development. For example, according to Training’s U.S. Training Census and Trends Report (1983), the average age of U.S. trainers is 33 years. However, by the year 2000, “workers age 55 through 64 will be the fastest-growing segment of the workforce” (Deets, 1999, p. 80). Shields, Hentges, and Yaney (1990) warned that a sociocultural difficulty may occur in the trainer-trainee relationship when a younger instructor addresses older workers. There may be age bias directed by the younger employee (who often is in a supervisory position) towards the older employee. The older employee might reciprocate the ageism by rejecting information and advice from a younger person.

Considering the shifting age composition of the American workforce, human resource practitioners will need to become familiar with the attitudes and values of older workers so that they can sensibly address the needs relevant to this group. For example, how might the needs of older workers differ from the needs of younger employees in learning environments? According to Zemke et al. (2000), “Each has its own learning

style, determined more than anything else by the way they were taught when they were in school” (pp. 242-243).

According to Welford (1987), successful training programs for older adults depend largely on the “methods used and the attention given to the human sensitivities of the trainees” (p. 585). In order for younger trainers to select the appropriate methods and demonstrate sensitivity to the needs of an increasingly older population of trainees, two events must occur (a) Trainers need to become knowledgeable about age-related changes in their trainees’ learning and work behaviors; and (b) age differences between trainer and trainee, based on the evidence reviewed, must not interfere with the trainer-trainee relationship.

In a survey of political and social trends, the Society for Human Resource Management (1999) predicted “intergenerational tension between ‘Xers’ and ‘baby boomers’.”

The controversy swirling around the long-term viability of Social Security and Medicare may spark backlash among Generation X members against the generations populated by their parents and grandparents. Because the proportion of Americans over the age of 80 is expected to grow from 22 % of the population in 1990 to 36 % by 2050, Generation Xers are afraid they will be taxed at higher rates to pay government-sponsored care and retirement benefits. In addition, Generations Xers are convinced that they will wield no political power because of the sheer size of the baby boom generation. The fact that the majority of people receiving Social Security and Medicare benefits will be white, while those supporting the system will be minorities, may also be a source of conflict. ([On-line]. Available: <http://www.shrm.org/trends/visions/1199d.asp>)

Therefore, any counterproductive ageist attitudes or endorsements of age-related stereotypes that younger trainers might have concerning their older trainees must first be identified in order to be redressed effectively.

In organizations in which older workers are considered less able or willing to adapt to change, more difficult to train, and more fixed in outdated ways, opportunities for training and advancement are severely curtailed. Barth, et al. (1995) have suggested that managers are reluctant to invest further in older workers' professional development. However, among employers who do offer training, there is evidence that older workers want to learn. This finding has led researchers to conclude that stereotypical thinking about older workers' suitability for training is more of a statement about managers' calculations of immediate return on investment than about the workers themselves (Dixon, 1990; Phillips, 1996, 1991). Fewer than 11% of the major organizations have even attempted to evaluate the costs and benefits associated with training older workers (Carnevale & Stone, 1994). Only 16% of respondents to the Louis Harris Laborforce 2000 survey cited high training costs as a reason not to retain or hire older workers (Carnevale & Stone, 1994).

The difference between organizations that value older workers and those that don't seems clearly to be a function of the degree to which ageism in the workplace is present. There is a small body of human resource and business literature concerning workplace interventions and strategies for redressing organization-wide ageism. Three categories frequently appear: (a) age-neutral policies and programs; (b) age-tailored training programs; and (c) diversity programs. A brief discussion of each is presented.

Age-neutral Policies

A study that contributed to the development of the age-neutral philosophy is the Grumman Aerospace Corporation study (Carnevale & Stone, 1994). The economic constraints of the mid-1970s forced layoffs of 13,000 Grumman Aerospace workers. Management made layoff decisions based on each individual's job performance, regardless of age. Following the layoffs, the average age of the firm's labor force had risen from 37 to 45 years old. By 1980 Grumman's age-blind policy had created an effective workforce in which 83% of its officials and managers, 70% of its professional employees, and 66% of its technical staff were age 40 or older.

Age-neutral policies and programs are typically associated with organizations that value their human capital assets, regardless of age. Career development philosophies in these organizations are characterized by a "life span" approach. "A life span approach to career development emphasizes the fact that behavior change processes can occur at any point in the life course" (Sterns, et al., 1994, p. 8). Furthermore, age-neutral policies provide assurance that older persons who elect to continue working "will have access to career opportunities consistent with their aspirations, abilities, and potential" (Sterns, et al., p. 7).

At Multitech, a high-technology multinational corporation, human resource planners have developed a corporate-wide, comprehensive program for upgrading skills and professional development. Multitech uses individualized training, job rotation, and internship assignments to break through age barriers. Senior employees in skills-upgrading programs collaborate with or work under the supervision of a young scientist,

engineer, or manager. Senior employees mentor junior colleagues to help them develop professionally. Each foreman, supervisor, manager, and executive is expected to serve as an informal coach from the initial day of employment. Multitech offers its employees a variety of complete retirement, postretirement, and second-career options. It has established its own temporary help pool for retirees who want or need to work part-time. Multitech offers a tuition-reimbursement program to retiring workers preparing for second careers. Multitech is committed to further research on training effectiveness and learning pedagogies for workers in all age categories (Rosen & Jerdee, 1985).

Age-Tailored Training Programs

There is a pervasive myth that older workers are afraid of technology and do not want to learn new skills (Harkness, 1999). But many companies that have invested in computer training for their older workers have been pleasantly surprised by the results (Shields, et al., 1990; Thornburg, 1995). When companies tailor programs to the age, knowledge, and experience of older workers, training proves just as effective as, and no more expensive than, it does for younger workers. Examples of companies that have tailored training to the needs of older learners include the following: (a) General Electric Aerospace Electronics Systems Department in Utica, New York, (b) Russell Corporation, and (c) Days Inn (Carnevale & Stone, 1994). In 1977, the Utica, New York, General Electric Aerospace Electronics Systems Department set up a program to move [older] design engineers from analog technology to digital technology. As a result of this program, the department successfully updated the skills and knowledge of older engineers (average age over 40). At the Russell Corporation, when instruction is done

on-site by qualified specialists in adult education, older workers perform well in classroom situations using computer-based learning. At Days Inn, efforts to teach computer-illiterate older workers how to operate a sophisticated automated reservation system resulted in employees 55 and older requiring three more weeks of training than did their younger counterparts. The additional training time increased the cost to the company by 50%. If the additional cost had been the only consideration, the Days Inn experiment would have served only to fuel prejudices about the capabilities of older workers. Instead, trainers analyzed the needs and backgrounds of their students and tailored their designs to the need of their audience.. Subsequent to the accommodations, older workers unfamiliar with computers needed only half a day of familiarization with the technology. Once they had familiarized themselves, the older workers learned the company's complex system as easily as younger trainees with different backgrounds.

In a comparison of management's attitudes and actions, the Commonwealth Fund Survey yielded a high correlation between management support and the percentage of companies that focus on the needs of older workers in their retraining and job redesign programs (Carnevale & Stone, 1994). In another study, it was found that management's careful attention to the job analysis function within the organization can contribute substantially to minimizing age discrimination (Elliott, 1995). Some companies have taken steps through age-tailored training programs to ensure that older workers do not fall behind rapidly changing technology. These companies include: (a) Crouse-Hinds, a New York manufacturer of electrical products; (b) AT&T; (c) Control Data Corporation, a

Minneapolis-based computer manufacturer; and (d) Kelly Services, Inc, a large temporary services firm (Bovey, 1987).

Diversity Training Programs

The 1987 Hudson Institute report, Workforce 2000, made diversity a household word (Karp & Sutton, 1993):

Workplace 2000 is here. A bigger issue has superseded the concerns of racial, gender, and ethnic diversity: age diversity. There are 4 age cohorts in the workplace now and a fifth coming on by the year 2005. These five groups share some traditional work values but differ on such important ones as the role of managers, employer/employee loyalty, telecommuting, technical competence, and what constitutes a good day's work. (Kennedy, 1999)

In organizations that value diversity and treat ageism as a diversity issue, younger employees are sensitized via diversity training to interact effectively with older workers. According to Kaeter (1995), the "attitude of the company is critical" (p. 65). As a result of their work, Zemke, et al. (2000) suggested that "there are two keys to creating a successful intergenerational workforce: aggressive communication and difference deployment. In aggressive communication, generational conflicts and potential conflicts are anticipated and surfaced" (p. 153). Monsanto Chemical is an example of a company with a successful intergenerational workforce. It has a Process for Diversity Management program "aimed at making people more efficient and effective in their interpersonal relationships on the job" (Galagan & Cummins, 1993, p. 45).

However, it should be noted that not all diversity training programs are effective. Effectiveness is at risk when one or both of the following factors occur: (a) training is conducted in environments that place a low value on diversity (Rynes & Rosen, 1994); and (b) programs are implemented in the absence of management support (Delatte & Baytos, 1993; Rossett & Bickham, 1994).

In addition to these two environmental factors that can mitigate the effects of diversity training, Karp and Sutton (1993) believe that diversity training programs share seven characteristics that potentially be sources of a flawed approach: (a) trainer gender (i.e., women only), (b) emphasis (i.e., sensitizing white males), (c) values that are too specific, (d) a narrowly defined program theme, (e) motivation for change (i.e., guilt vs. responsibility), (f) tone of the message (i.e., how it is delivered vs. the content itself), and (g) the time orientation (i.e., past and future vs. present).

One way that diversity training programs can be effective is through the use of games. Trainers are finding that they can use games to introduce the topic of diversity to employees or to incorporate the games into existing diversity training programs as followup reinforcement. Games raise awareness about diversity topics in a nonthreatening manner and stimulate conversations about a multitude of diversity issues among workers. The experiences gained through the interaction of the games are as valuable as the knowledge learned (Gunsch, 1993). Therefore, the effectiveness of diversity training programs can be influenced by the organizational environment in which the programs are implemented, the design characteristics of the programs themselves, and the use of games.

Games are among a variety of interventions (discussed more fully in chapter 2) that have been used in gerontological education to sensitize healthcare students to the needs of older adults. Three widely used methods of teaching gerontology reported in the literature include (a) formal lecture courses to increase the level of knowledge, (b) group discussions on attitudes and feelings about older persons, and (c) informal contacts with both well-functioning and ill older persons (Carmel, Cwikel, & Galinsky, 1992).

The method of teaching that significantly affected level of knowledge was formal lectures. This change, however, was not expressed in further changes of attitudes and work preferences. The increase in knowledge after the courses among those who already had a previous relationship with an elderly person suggests that a positive emotional predisposition can provide a fertile base for increasing knowledge even though it did not affect work preferences or attitudes. (Carmel et al., 1992, p. 337)

Most evaluations on the effectiveness of courses on changes in knowledge and attitudes have primarily focused on the short-term effects immediately at the end of the course.

Because attitudes are deeply rooted in cognitive entities, there is reason to believe that short-term achieved changes can diminish over a longer period of time, or alternatively, that null short-term effects on attitudes can become positive in the long-run after students have time to better absorb the new information. (Carmel et al., 1992, p. 331)

According to the authors, attitudes and work preferences are a product of complex socialization processes crystallized over a period of time and, therefore, cannot be expected to change after exposure to a short course in gerontology (p. 338). However, multimodal training programs including instruction on normal aging and development,

empathy exercises, and clinic-oriented experiences, have produced improved attitudes and knowledge (Intrieri, Kelly, Brown, & Castilla, 1993, p. 373).

One method that has yielded more consistent findings across studies is a combination of experiential learning with cognitive information about the effects of aging. Training programs that have provided instruction about normal aging and development, practice-based exposure to older patients, and experiential or empathy based exercises to enhance understanding of the aging experience have more often produced some change in knowledge and attitude (Intrieri et al., 1993, p. 374).

One example of an experiential-based exercise is a simulation or simulation game. Simulation is defined as something that pretends to be something else. It is a representation of reality; it is not a duplication of the reality itself (Pfeiffer & Ballew, 1988a, p. 47). Simulations can be used to train many of the softer skills, such as selection interviewing, performance appraisal counseling, and even more general managerial skills. Another common use of simulation in soft-skill training is the use of role-playing exercises (Wehrenberg, 1986, p. 102).

Of the three categories of interventions for redressing ageism found in the literature – age-neutral policies, age-tailored training programs, and diversity training programs that use games – none of the literature suggested specific interventions and strategies for redressing ageism in workplace environments. However, given that experiential-based exercises have been used effectively to redress ageism in gerontology education and the use of games has augmented the effectiveness of diversity training programs in organizations, it is reasonable to hypothesize that an experiential-based

exercise such as a simulation game might be effectively used by human resource practitioners to redress workplace ageism.

Rationale for Using a Simulation Game

The relative merit of simulation games versus other teaching approaches has been investigated by a number of researchers. By the late 1980s the use of training games and gaming simulations was common. More than 50% of the companies in the United States used some type of game or gaming simulation in their training (Faria, 1987; J.J. Kirk, 1997).

Across all reported studies, simulation games were found to be more effective than conventional instructional methods in 75 of the comparisons, and no differences were reported in 58 of the comparisons. The reported studies included business as well as social science simulations (Dickinson & Faria, 1997, p. 264).

In business and management education, simulation games provide an opportunity for participants to test a variety of techniques and theories (Pfeiffer & Ballew, 1988a, p. 62). There are basically two types of simulations used in training: (a) those that deal with economic business concerns, and (b) those that deal with behavior (Pfeiffer & Ballew, 1988a, p. 53).

Trainers use games for bringing about changes in feelings and attitudes (Bredemeier & Greenblat, 1981). Games are used to train employees at all levels of the organization. Therefore, the purpose of this study, based on prior evidence, was to determine the effects of one type of diversity awareness training, a simulation game, on

knowledge of, and counterproductive attitudes toward, older workers held by current and future human resource management and development practitioners.

Statement of the Problem

There is a growing realization that the gulf of misunderstanding and resentment between older, not so old, and younger employees in the workplace is growing and problematic. It is a problem based in economics, demographics, and world views that must be confronted to be solved. (Zemke et al., 2000, p. 1)

Human resource management and development practitioners have a demographic imperative to assist their employers in developing intergenerational-friendly workplace environments.

Need for the Study

Presently, there is a dearth of empirically proven diversity awareness interventions that (a) increase participants' knowledge of age-related changes in the learning and work behaviors of older workers, and (b) promote the change of counterproductive attitudes toward older workers. According to Sheppard (1970), as early as 30 years ago, researchers were investigating (a) the process of aging and how it affects the work performance of different types of workers in varying jobs, (b) the need to systematize what we already know about aging-related conditions and actions that facilitate or hinder work performance, (c) the belief that job-finding problems of unemployed workers over a certain age are not related to their age but rather to the degree of obsolescence of their acquired skills, (d) the role of varying attitudes, levels of knowledge, policies and practices in the work careers of men and women as they grow

older, and (e) the effects of new institutional arrangements and methods on the work performance, job opportunities, learning achievements, retirement age, etc., of older persons. The author wrote that the realization of a “body of practitioners charged with the task of facilitating the training and employment of the so-called older worker” (p. 3) legitimizes the call for additional research.

Counterproductive attitudes, that are either positive or negative (Palmore, 1990) and mindsets about aging (E.J. Langer, 1989, 1997) based on stereotypical beliefs rather than empirical research can lead to serious short- and long-term consequences.

Therefore, the results of this study could serve as the impetus for the design, development and implementation of similar interventions to ensure that 21st-century organizations become intergenerational-friendly working and learning environments for all workers, regardless of age.

Research Questions

1. Will participants who play the Into Aging simulation game (treatment) score significantly higher on the ALWQ (knowledge measure) than participants who receive the traditional classroom lecture method of instruction?

2. Will participants who play the Into Aging simulation game (treatment) experience a significant change in attitude as measured by the AGED Inventory (attitude measure) unlike participants who receive the traditional classroom lecture method of instruction?

Assumptions

1. The training received by each participant in both the treatment and control groups was equivalent in content and quality and was delivered by professional instructors.

2. A professional instructor for the purposes of this study is defined as an individual who is either employed by an organization in a full-time instructional position or is paid as an outside consultant or subcontractor to perform instructional activities for an organization. In addition, this individual is a member of a recognized training-related professional association, such as ISPI (International Society for Performance Improvement), ASTD (American Society for Training and Development), and/or the Society for Human Resource Management (SHRM).

3. Every effort was made to comply with the parameters of ethical research according to the University of North Texas Human Subject Research guidelines.

4. Every effort was made to minimize the Hawthorne effect (i.e., “the subject’s knowledge that he is participating in an experiment” [Huck et al., 1974, p.265]).

5. The participants in this study varied in age, gender, job position, and work experience, but not in chosen vocational interest.

6. The ALWQ (Aging, Learning and Work Quiz), as reported in the literature, had sufficient validity and reliability indices to ensure that each participant's knowledge of age-related changes in learning and work behaviors was accurately assessed.

7. The AGED (Age Group Evaluation and Description) Inventory, as reported in the literature, had sufficient validity and reliability indices to ensure that each participant's attitudes were accurately assessed.

8. The KAMI (Knowledge Accessing Modes Inventory), as reported in the literature, had sufficient validity and reliability indices to ensure that each participant's epistemic orientation for randomized blocking purposes was accurately assessed.

9. The subjects involved in the study participated willingly and expended their best efforts on the three instruments.

10. Demographic data were collected to determine the frequency of exposure to corporate downsizing/mergers, lateral transfers/demotions, constructive dismissals/terminations, and illnesses/disabilities experienced either personally or by participants' spouses, significant others, or family members.

11. The information derived from this investigation is valuable to Human Resource Management and Development practitioners.

Delimitations and Limitations

Delimitations

1. This investigation was restricted to a target population represented by the combined membership of (a) the American Society for Training and Development (ASTD) Dallas Chapter, (b) the Society for Human Resource Management (SHRM) chapters located in the Dallas-Ft. Worth Metroplex, and (c) senior undergraduate students at a state university enrolled in human resource management courses at the time of the study. According to Locke (1986), “There is no way to determine deductively whether there are critical differences between students and employees, or what types of differences would affect the generalizability of what types of findings” (p. 5).

2. For future research, demographic data about the participants’ age, gender, educational level, work experience, and length of time in current job positions were collected. However, they were excluded from examination in the statistical analysis of this investigation.

3. The participants in this study were treated at different times and settings due to the logistical challenges associated with conducting experimental research in field settings. “The evidence indicates that a detailed, point-by-point similarity with respect to subjects, tasks, settings, and so forth is not necessary in order to achieve generalizability” (Locke, 1986, p. 6). “To achieve similarity between lab and field settings on all dimensions alleged to be involved in external validity is impossible” (Locke, 1986, p. 7).

Limitations

1. The participants in this study voluntarily attended the workshop.
2. Only one covariate (learning style or epistemic orientation) was controlled through randomized blocking for the purpose of this study.
3. The length of exposure to the treatment was 1.5 hours.
4. Only two post-intervention assessments were used.

Definition of Terms

Ageism. The process of systematic stereotyping and discrimination against people because they are old, just as racism and sexism accomplish this for skin color and gender (Butler, 1987).

Attitude. An evaluative emotional disposition to an object or toward an object of value (Allport's definition, as cited in Bischof, 1964).

Baby boomers. Age cohort of persons born between 1943 and 1960 (Zemke, Raines & Filipeczak, 2000).

Biological age. An individual's position relative to his/her potential life span (Sterns & Miklos, 1995).

Category. An accessible cluster of associated ideas, which as a whole has the property of guiding daily adjustments (Allport, 1958).

Chronological age. Changes that occur in biological, psychological and social functioning through time (Sterns & Miklos, 1995).

Chronological diversity. The age distribution in the workforce (Wilkinson, 1997).

Cohort. An aggregate of individuals that retains its identity through time (Nydegger, 1987).

Cohort effects. The typical response patterns of members of various cohorts to the same thing (Rosow, 1978).

Delphi Method. A method for structuring a group communication process, so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem. It involves some feedback of individual contributions of information and knowledge; some assessment of the group judgment or view; some opportunity for individuals to revise views; and some degree of anonymity for the individual responses (Linstone & Turoff, 1975).

Epistemology. The theory of knowledge (Bower & Hilgard, 1981).

Epistemic orientation. One of three possible modes for acquiring knowledge. Epistemological concerns about the process of acquiring knowledge is acknowledged to be one of the major thrusts of the closing decades of the twentieth century. (Rancourt, 1986).

Ergonomics. The scientific study of man in relation to the work environment (Murrell, 1970).

Functional age. A measurement index of an individual's skills and abilities relative to the specific requirements of a particular job (Czaja, 1995).

Games. Competitive activities with sets of rules and specified goals with outcomes determined by skill or chance or a combination of the two (Walter & Marks, 1981).

Game elements (simulation games). Elements of the reference system and their relations represented by design elements like scenario, events, roles, rules, and accounting system (Peters, Vissers, & Heijne, 1998).

Half-life. The time it takes for individuals to lose about half of their competence due to changes in knowledge and technology (Rosen & Jerdee, 1985).

Human resource development. "The integrated use of training and development, organizational development, and career development to improve individual, group and organizational effectiveness." (McLagan, 1989, p. 7)

Human resource management. "A staff, or support function in the organization responsible for providing assistance in human resource management matters to line employees, or those directly involved in producing the organization's goods and services." (Decenzo & Robbins, 1999, p. 8)

Illustrated lecture. A method of instruction whereby the trainer provides information verbally and supplements content with a variety of questions, interaction, audio-visuals, and instructional materials (Sullivan, Wircenski, Arnold, & Sarkees, 1990).

Industrial gerontology. The study of the problems of the older worker (Murrell, 1970).

Knowledge. The apprehension or understanding of data (information) that has been filtered by the senses, the mind, or subjective experience. Knowledge is personalized information (Rancourt, 1986).

Knowledge accessing modes. Epistemic ways of knowing that represent a valid path to acquiring knowledge (Rancourt, 1986).

Learning style. A person's preferred way of processing information within specific learning situations (Caffarella & Barnett, 1994).

Lifespan approach. A philosophy that maintains that behavioral change can occur at any point in the life cycle, individual difference are more common as we grow older, and chronological age should not be used as an index of ability (Czaja, 1995).

Mindset. A premature cognitive commitment resulting from the unconditional acceptance of information by which negative stereotypes about aging influence our thinking (E.J. Langer, 1997).

Model validity. The extent to which the investigation (i.e., learning, taking, decisions, etc.) of a model provides the same outcomes as would investigation of a reference system (Raser, 1969).

Nexters. Age cohort of persons born between 1980 and 2000 (Zemke, Raines & Filipczak, 2000).

Obsolescence. A reduction in work effectiveness when employees fall behind in understanding how to use new tools and techniques or fail to recognize how the application of new knowledge can improve their performance (Rosen & Jerdee, 1985).

Older worker. As defined by the Age Discrimination in Employment Act, any individual forty years and over who is an active member of the workforce (Czaja, 1995). Consistent with the literature reviewed (Hassell & Perrewé, 1995), for the purpose of this study, “older worker” will be defined as an employee between the ages of 50 and 62 years old.

Predictive validity (simulation games). The degree to which simulation games can reproduce historical outcomes or predict the future (Raser, 1969).

Prejudice. An aversive or hostile attitude toward a person who belongs to a group simply because he belongs to that group, and is therefore presumed to have the objectionable qualities ascribed the group (Allport, 1958).

Premature cognitive commitment. Mindsets that we accept unconditionally, without considering or being aware of alternative forms that the information can take (E.J. Langer, 1997).

Process validity (simulation games). The degree to which the processes observed in a game are isomorphic (similar in form) to those observed in the reference system (Raser, 1969).

Psychological age. An indication of an individual’s capacity to adapt behavior to the demands of the environment (Sterns & Miklos, 1995).

Psychological reality. A [simulation] game is valid to the degree that it provides an environment that seems realistic to the players. If they do not see the game as realistic, behaviors in the game do not correspond to behaviors in the reference system (Raser, 1969).

Reference system (simulation games). The problem or situation that is the subject of our research, teaching or policy (Peters et al., 1998).

Role assumption exercise (simulation games). When participants intentionally place themselves in situations or seek experiences that they would not normally engage in (a) to

gain understanding of the life experiences of others (for example, volunteering in a prison), or (b) to gain fresh perspectives on their own experiences (for example, adventure programs) (Lee & Caffarella, 1994).

Role-playing. A popular and engaging method of instruction in which participants assume a prescribed perspective or set of behaviors (Walter & Marks, 1981).

Simulation. An attempt to reproduce in simplified form, some aspect of reality so that others, by being immersed in a prescribed format, can experience a facsimile of that reality (Walter & Marks, 1981).

Simulation game. A combination of aspects of games and simulations; there are specified participant goals within a set of rules, but the format and rules are designed to reflect some aspect of reality (Walter & Marks, 1981).

Social age. Social norms and roles applied to an individual with respect to a culture or society (Sterns & Miklos, 1995).

Stereotype. An exaggerated belief or a fixed idea associated with a category; its function is to justify (rationalize) our conduct in relation to that category (Allport, 1958).

Structured experience. Not a simulation game; rather a carefully thought-out design or sequence of events that attempts to lead to a specific range of results (Pfeiffer & Ballew, 1988a).

Structural lag. The phenomenon that occurs when the opportunity structures in an industrialized society that support and shape lives at all ages remain largely static and constrained while the numbers of capable and long-lived persons mounts dramatically (Riley et al., 1994).

Structural validity (simulation games). The degree to which the theory and assumptions on which [a game] is built (i.e., structure) can be shown to be isomorphic (congruency between the elements and relations of both systems) to that of the reference system (Raser, 1969).

Veterans. Age cohort of persons born between 1922 and 1943 (Zemke, Raines & Filipczak, 2000).

Xers. Age cohort of persons born between 1961 and 1980 (Zemke, Raines & Filipczak, 2000).

Summary

This chapter has served to introduce an investigation designed to answer two research questions about the effects of a simulation game on trainee's knowledge and attitudes about the age-related changes in the learning and work behaviors of older workers. The problem is that human resource management and development practitioners have a demographic imperative to assist their employers in developing intergenerational-friendly workplace environments. Presently, there is a need for empirically proven diversity awareness interventions that (a) increase participants' knowledge of age-related changes in the learning and work behaviors of older workers, and (b) promote the change of counterproductive attitudes toward older workers. In order to enhance the logistical feasibility of completing this study in a timely manner, this investigation was restricted by several delimitations and limitations that included a narrowly defined applicant pool representing a target population of current and future human resource management and development practitioners, voluntary participation by the subjects, and brief duration of exposure to treatment. Terms that are pertinent to this study have been listed and defined. A review of relevant literature is presented in chapter 2. A discussion of the methodology is presented in chapter 3. The results of the study are reported in chapter 4. Conclusions and recommendations for further research outlined in chapter 5.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

This chapter is a review and summary of relevant literature on ageism in the workplace, training older workers, and simulation games. The review is presented in three parts. The first part of the chapter consists of a review of current literature and research concerning the psychology of ageism and the effects of ageism in the workplace.

The second section of the chapter reviews and summarizes literature on issues specifically relevant to training older workers, including prevalent myths and stereotypes about training older workers, research that refutes myths and stereotypes about training older workers, and known techniques and methods for effectively training older workers.

The latter part of the chapter provides a cursory review of the literature pertaining to experiential learning theory, simulation games, learning style as a covariant, and a summary of relevant studies in educational gerontology that seek to increase knowledge of age-related changes in human development and redress counterproductive attitudes toward older adults.

Psychology of Ageism

The psychology of ageism is a social psychology – one that has evolved from the “scientific study of the personal and situational factors that affect individual social behavior” (Hunt, 1993, p. 397). An understanding of the psychology of ageism leads to a greater awareness of, and ability to recognize, its effects on human behavior. A quote by Samuel Johnson aptly illustrates how ageism affects the perceptions of others:

“If a young or a middle-aged man, when leaving company, does not recollect where he had laid his hat, it is nothing; but if the same inattention is discovered in an old man, people will shrug their shoulders and say, ‘His memory is going.’” (as cited in Palmore, 1990, p. 3)

Human resource practitioners who can recognize the effects of ageism in their own and other’s behaviors are better positioned to effectively redress ageism in the workplace.

Ageism Defined

Like most constructs in social psychology, ageism is difficult to define. However, the two most prominent definitions in the literature come from Butler (1987, 1993) and Palmore (1990). Butler actually coined the term ageism in 1968. He defined ageism as follows:

[It is] the process of systematic stereotyping and discrimination against people because they are old, just as racism and sexism accomplish this for skin color and gender. Ageism allows the younger generation to see older people as different from themselves; thus, they suddenly cease to identify with their elders as human beings and thereby reduce their own sense of fear and dread of aging. (Butler, 1987, p. 22)

Palmore (1990) defined ageism as “any prejudice or discrimination against or in favor of an age group” (p. 4). Both definitions associate ageism with prejudicial and discriminatory behavior toward groups defined by age (e.g., younger toward older), just

as racism is characterized by discrimination and prejudicial behavior toward groups defined by ethnic origin and skin color.

Prejudice, in terms of human thought, is a paradox. Holding a prejudice, for or against, is a willed act of mind – prejudices may be learned, but they are not instinctive – and the sum of our prejudices is a major part of our psychic identity. And yet, prejudice is, precisely, the decision not to be open-minded, not to think. (McLeish, 1993, p. 589)

Nature of Prejudice

To understand the psychology of ageism, it is helpful first to know something about the nature of prejudice. In writing his seminal contribution, Nature of Prejudice, Harvard psychologist Gordon W. Allport was greatly influenced by the social psychology of Nazi Germany. Much of his treatise on prejudice stems from his observations of the societal effects of anti-Semitism and racism during and following W.W.II. Allport subscribes to “trait theory” defined as a “scientific version of the commonsense view that each person has a recognizable set of characteristics and usual ways of behaving in particular situations” (Hunt, 1993, p. 315). He considers traits to be the “fundamental and relatively stable units of personality” (p. 318). Allport’s theory about the nature of prejudice, commonly cited in gerontology literature, is a widely accepted foundation for the psychology of ageism.

From Allport's perspective, prejudice in the psychological sense is "negative overgeneralized judgment" (Allport, 1958, p. 11). Allport considered two ingredients essential to prejudice: (a) a favorable or unfavorable attitude, and (b) an erroneous belief. Allport contended that attitudes are different from beliefs, in that "certain programs designed to reduce prejudice succeed in altering beliefs but not in changing attitudes" (p. 13). Most beliefs can be altered using a rational approach, but negative attitudes are much harder to change. However, beliefs can become resistant to change if they accommodate negative attitudes. This accommodation of beliefs to attitudes is what Allport termed, "rationalization" (Allport, 1958, p. 13). Palmore (1990) suggested that, in the area of ageism, rationalization can take many forms:

Forced retirement may be rationalized on the grounds that the older worker is no longer competent, or is slowing down, or is old-fashioned, or is unattractive; when the primary reason is to replace a higher paid (older) worker with a lower paid (younger) worker. (p. 56)

Allport (1958) wrote:

Not every overblown generalization is a prejudice; some are simply misconceptions, wherein we organize wrong information. If a person is capable of rectifying his erroneous judgments in the light of new evidence he is not prejudiced. Prejudgments become prejudices only if they are not reversible when exposed to new knowledge. A prejudice, unlike a simple misconception, is actively resistant to all evidence that would unseat it. We tend to grow emotional when a prejudice is threatened with contradiction. Thus the difference between ordinary prejudgments and prejudice is that one can discuss and rectify a prejudgment without emotional resistance. (pp. 9-10)

Based on Allport's (1958) distinction between a prejudice and a misconception, a question that requires further research is, What is the root of ageism in the workplace: misconceptions based on wrong information or full-blown prejudice? It is this researcher's hypothesis that workplace ageism is more frequently a function of wrong

information than of emotionally resistant overgeneralized judgments. Allport's contention was that truly prejudiced people think differently from tolerant people (i.e., those who can recognize and respect the opinions, beliefs, and differences of others). Prejudice is more likely to be a "reflection of the person's whole habit of thinking about the world in which he lives" (Allport, 1958, p. 170).

Prejudiced individuals, according to Allport (1958), are characterized by (a) black and white thinking, (b) inability to think outside of the box, (c) resistance to lateral thinking, (d) an intolerance of ambiguity, and (e) overgeneralizing. Based on these characteristics of prejudiced people, human resource practitioners might reconsider a hasty evaluation made of an older worker's expressed resistance to new ideas, information or processes, and ask, Is the resistance a function of age, or of prejudice?

Based on Allport's (1958) model, Process of Categorization, which explains how prejudice is formed in one's thinking, if beliefs are strongly associated with, or overpowered by emotions, they are more likely to side with emotion than with objective factual information. The mind selectively admits new information that confirms previous beliefs. If the new information contradicts the incumbent belief, the mind resists admitting it. If the mind cannot fit the new information into a category (i.e., categories enable the mind to quickly identify a related object), the mind rejects the new information. However, openminded people (i.e., those who go through life questioning every broad generalization and have learned from experience that categories can be erroneous and should be revised) are more likely to accept information that is different from preconceived ideas (Allport, 1958).

Stereotypes and Attitudes

The literature varied on definitions and characteristics of stereotypes and attitudes. Within gerontological literature, stereotype traditionally has been employed to convey “negative attributes of the status of the aged” (Brubaker & Powers, 1976, p. 441). Thomas (1981) suggested that stereotypes are intellectual constructs that stem from facts. Using the example that most Americans believe their memory will inevitably decline in old age, E.J. Langer (1997) explained that we pick up stereotypes as young children and pass them from generation to generation as mindsets:

Mindsets about failures, be they about poor memory or any negative expectations may unnecessarily limit us. Others argue that an expectation of memory decline creates the reality and that if the expectation could be changed, many aspects of memory decline could be reduced. (E.J. Langer, 1997, p. 90)

The mechanism by which these negative stereotypes about aging influence our thinking as we become old is an effect E.J. Langer (1997) labeled “premature cognitive commitments” (p. 92). Premature cognitive commitments are unconditionally accepted mindsets. Once a person processes information unconditionally, the information becomes a fact that the mind does not reconsider without justification. According to the author, “Unconditional acceptance of information occurs frequently with information that initially seems irrelevant, such as information about old age [encountered] in childhood” (p. 92).

Snyder (1989) agreed with Allport (1958) that as long as stereotypes make it easy to bring to mind evidence that validates old categories, people will cling to erroneous beliefs. “Once a person adopts stereotyped ways of thinking about another person,

people tend to notice and remember ways in which that person seems to fit the stereotype, while resisting evidence that contradicts the stereotype” (p. 198).

The powerful influence of stereotypical beliefs on expectations and behavior was clearly demonstrated by Rosenthal and Jacobson in the 1960s (Pratt & Norris, 1994; Snyder, 1989). Rosenthal and Jacobson demonstrated that teachers’ biased expectations about students could affect classroom behavior and student progress. They labeled this the “Pygmalion effect.” A group of students was identified to their teachers as children who could be expected to “blossom” in intellectual achievement during the school year. What the teachers did not know was that the children had been selected at random by the researchers. During the course of the year, something happened in the relationship between teachers and their supposedly gifted pupils that led the children to achieve measurable gains in test performance over a comparison group of students “who were not so designated” (Pratt & Norris, 1994, p. 91).

A significant problem with allowing stereotypes to influence behaviors is that members of the stigmatized groups often subscribe to stereotypes about themselves (Pratt & Norris, 1994). This consequence is especially unfortunate if the stereotypes are negative, such as those about older adults. A more detailed discussion of this consequence appears later in this section.

Stereotypes are often not easily identified as such. Several authors have attempted to define the characteristics most commonly associated with stereotypes. Allport (1958) maintained that (a) sometimes a stereotype is so powerful that it can defy all evidence that would negate it, (b) some stereotypes can be totally unsupported by facts while others develop from an overgeneralization of facts, (c) stereotypes can prevent

people from thinking outside of the box about concepts, (d) stereotypes can filter out complexity and maintain simplicity in thinking and perception, and (e) stereotypes are fostered by selective perception and selective forgetting.

Brubaker and Powers (1976) along with Palmore (1990) suggested that stereotypes and attitudes [toward older people] can be negative or positive. Palmore (1990) also found that stereotypes are (a) more cognitive while attitudes are more affective in nature, although both tend to go together (i.e., negative stereotypes usually produce negative attitudes and negative attitudes support negative stereotypes), (b) positive stereotypes and attitudes lead to positive discrimination in favor of the elderly (i.e., senior discounts, and property tax deductions), and (c) negative stereotypes and attitudes lead to negative discrimination (i.e., hiring discrimination). For example, Palmore (1990) wrote that “8 out of 10 Americans still believe most employers discriminate against older people and make it difficult for them to find work” (p. 27).

In their research, Kite, Deaux and Miele (1991) found that age stereotypes are more pronounced than gender stereotypes. Katz (1990a) added that negative attitudes [toward older people] cut across all ages, educational levels, geographical locations, social classes, occupations, and even length of work experience with older persons.

Prevalence of negative attitudes. A number of researchers offer explanations for the prevalence of negative attitudes toward older people in America’s youth-oriented culture. These explanations include: (a) authoritarian personality traits (Katz, 1990b; Palmore, 1990; Thorsen & Perkins, 1981); (b) personally experienced physical and/or psychological symptoms of aging (i.e., the greater the number of symptoms a person experiences the greater the number of stereotypes he or she accepts) (Tuckman & Lorge,

1957); (c) anxiety about aging that leads to avoidance of the reality of aging (Butler, 1987); (d) the age of the perceiver (i.e., older people are inclined to have more positive stereotypes about aging than younger people (Hassell & Perrewé, 1995); and (e) childhood internalization of stereotypes (i.e., the way one first takes in information (mindfully or mindlessly) determines how it is later used) (E.J. Langer, 1989, p.25).

Two additional explanations warrant discussion. These are the self-fulfilling expectations that older people have about themselves and the methodological flaws in the design of studies about attitudes toward older people.

Self-fulfilling expectations and negative stereotypes. Brubaker and Powers (1976) challenged the assumption that an older person necessarily accepts a negative stereotype of old age and accepts a negative self-definition.

The character of the stereotype of old age affects not only the manner in which younger persons perceive and interact with [older] individuals but also influences the self-definitions and behavior of older persons. Chronological age is not sufficient to determine a person's self-definition as old although there is some relationship between chronological age and self-perception. (p. 442)

Brubaker and Powers (1976) proposed a different model “in which the self-concept formed at an earlier age mediates between the definition of self as old and the acceptance of a stereotype as old” (i.e., cohort effects among older people mediate the acceptance of negative stereotypes and negative self-definitions – direct contact with one's peers is likely to result in positive stereotypes) (p. 446). The Brubaker and Powers model carefully discriminates between the concepts of “generalized old” and “personalized old” (p. 446).

A more recent study (E.J. Langer, 1997) concerned the impact of self-fulfilling expectations on memory loss and on attitudes toward aging in two cultures: the Chinese and the American deaf. These two cultures differ significantly from the United States in the spread and acceptance of negative stereotypes about aging. E.J. Langer (1997) hypothesized that if negative stereotypes create self-fulfilling expectations that contribute to memory loss in old age and the two selected groups view aging more positively than nonhearing impaired Americans, then both the deaf and the Chinese would show less memory loss with aging. Langer's findings yielded a positive correlation between positive views toward aging and better memory performance among older subjects. Young subjects in each culture performed similarly on the memory tests, but the elderly Chinese and American deaf participants outperformed the elderly hearing American group. The author's findings support the premise that cultural beliefs about aging play a role in determining the degree of memory loss that people experience in old age.

Methodological design flaws. Unfortunately, many findings in the research on attitudes and perceptions of older people are methodologically dependent. Methodological flaws in early gerontological research yielded mixed results. Current researchers are using better methods and measures (Green, 1981). Several recent studies about the methods used to identify negative stereotypes have suggested design flaws that probably distorted the outcomes of prior studies. Many of these design flaws (i.e., sampling, inappropriate selections of age/cohort boundaries, use of cross-sectional vs. longitudinal approaches, failure to distinguish between normal age changes and disease, use of measurement scale with poor psychometric characteristics) have led to ageist interpretations of research findings (Schaie, 1988).

Brubaker and Powers (1976) argued that because of methodological flaws (e.g., exclusive use of surveys, etc.), research has not yet clearly demonstrated that stereotypes of old age are all negative. Instead, there may be an acceptance without careful scrutiny of the limited research that supports assumptions about older Americans. Attitudes toward old age “may not be as negative as gerontologists expect, or as the theorists assume” (p. 442).

Recent studies have addressed a number of the methodological design flaws found in earlier research. Brubaker and Powers (1976) point to internal validity. “Many of the early measures in gerontological research used scales purported to measure attitudes. “The scales actually consisted of items for measuring knowledge about late life” (p. 441). Braithwaite, Gibson, and Holman (1986) found that attitudinal measures that stereotyped to a generalized target (context-generalized) often produced more negative results than measures that stereotyped to a specific target (context-specific). “Where researchers have introduced specific individuals as the target to be assessed, there has been a marked failure to obtain negative stereotypical responses” (p. 317). In their review of the literature, Slotterback and Saarnio (1991) found studies mentioning either neutral or positive attitudes, and hypothesized that the “discrepancies across studies” might be the result of “discrepancies in methodologies across studies” (p. 563).

According to Green (1981), early research on attitudes and perceptions about older people relied on measurement instruments designed to explore general perceptions and attitudes. Recent studies that use a variety of methods have found a greater variance in perceptions. According to the author, recent work has suggested that sex, race, and various aspects of appearance interact with age and influence perceptions. Finally, the

author argued that prior contact with older people can influence perceptions positively or negatively. Green's (1981) overriding premise is that better methodology yields more accurate generalizable results.

Summary

Human resource practitioners who understand the psychology of ageism in terms of its theoretical foundation (i.e., the nature of prejudice), the definitions and characteristics of stereotypes and attitudes, and possible explanations for the prevalence of negative attitudes toward older people in the American culture – including those resulting from methodologically flawed research designs – are better positioned for identifying and addressing the effects of ageism in the workplace.

Just as racism may be an endemic part of American culture, in that many whites act on an unquestioned belief that Negroes are inherently inferior, it may also be that ageism is just as influential, in that a belief in the inevitable differences and changes through the process of aging in the area of work permeates the actions of Americans in their dealings with older workers – not just those in their 70's, but also in their 40's and 50's. (Barkin, 1970, p.17)

Effects of Workplace Ageism

The contributions of older workers to the American economy are “under-appreciated because of long standing prejudices” (Barth et al., 1995, p.38). These long-standing prejudices are evidenced by personnel and training policies in a number of organizations throughout the United States. In these organizations, ageism operates as a belief that older workers have fewer resources to exchange for a job. They are deemed to have less or somehow inappropriate education, to have too few working years left to justify training, and to be less physically and mentally capable than those more attractive

younger workers (Sterns & Sterns, 1995). In research studies, age does not appear to be a central variable affecting the perception of personal work-related traits, but in the hiring decision “its significance rises with increased employee age” (Craft, Doctors, Yitzchak, & Benecki, 1979, p. 95).

Data analyzed in the Louis Harris & Associates Laborforce 2000 Survey revealed that 40% of 406 companies who responded said they avoid hiring older workers because of the physical demands of work, despite the fact that relatively few jobs today require the ability to perform hard physical labor (Carnevale & Stone, 1994). Most jobs require cognition, experience, and wisdom – qualities that can be presumed to increase with age and are considered important competencies for many managerial and decision-making roles (Sterns & Sterns, 1995). Even so, 25% of corporate respondents in the Harris survey used the mental demands of work as a reason for not hiring older applicants (Carnevale & Stone, 1994).

Much of the underutilization of older Americans as workers – both those currently working and those wanting to work – is the result of “rigid corporate and government policies and practices” (Barth, McNaught & Rizzi, 1995, p. 61). Many assumptions about very old age have been transferred to workers in their 50s and early 60s. The result of this transference is that retirement age is typically viewed as a cutoff point for one’s working capabilities (Carnevale & Stone, 1994).

The Avolio Experiment (Carnevale & Stone, 1994) revealed the damaging effects of stereotypical assumptions about age. In his study, Avolio asked young professionals to listen to audio recordings of simulated interviews. Avolio told his subjects that the candidates had similar work experience and equivalent on-the-job performance. The

same actors voiced the young and the older candidates on the tapes. When it was time to evaluate the candidates, the listeners tended to regard the older workers as non-valuable contributors and to judge the younger ones as adequate performers (Carnevale & Stone, 1994).

In another study, female supervisors favored older employees less (regardless of the work environment) in their evaluations (F.P. O'Brien, Robinson, & Taylor, 1986). These authors's findings were further validated by Carnevale and Stone (1994) who reported that older workers are often the recipients of management's unjustified assumptions, particularly when it comes to competing with younger people for training. For example, older employees are often refused training opportunities, despite working in organizational cultures that value those who maintain and improve their skills. Some human resource managers believe that older workers are less flexible, are unwilling to learn or change their ways, and have work styles that conflict with the work styles of younger workers (Sterns & Sterns, 1995). These unjustified assumptions often lead to rationalizations based entirely on "the bottom-line":

Investing in older workers – whether by hiring them, training them, broadening their skills by varying work assignments, or retaining them – yields a poor return for the company resources expended. Ironically, when any of this holds true, it is largely because management or company policy has created a self-fulfilling prophecy. By devaluing its older workers, especially by denying them training, management creates a depressing work environment that encourages neither high quality nor productivity. (Carnevale & Stone, 1994, p. 105)

The effects of workplace ageism are numerous. They include: (a) the potential for lower employee morale and productivity; (b) a rising number of costly lawsuits; and (c)

demographics shifts that will make it difficult for organizations to maintain a highly skilled workforce in the midst of rapid technological change.

Employee morale and productivity

Workplace ageism promotes feelings of inadequacy among older workers (Carnevale & Stone, 1994). Employees who work in an environment influenced by ageist suppositions tend to believe that at a certain age they will, or have suddenly become, useless. In many cases, these feelings of inadequacy and loss of purpose conflict with an aging worker's growing need for the intrinsic rewards of work (e.g., job satisfaction, congenial coworker relationships, participation in meaningful activity) (Sterns & Sterns, 1995). Cleveland, et al. (1997) wrote that, "Many of the problems and challenges faced by older workers are likely to be the result of others reactions to and beliefs regarding the individual's age rather than a result of age per se" (p. 240).

Companies and managers who accommodate ageist myths about older workers often discourage them from participating in training opportunities that would keep their skills up-to-date. In such environments, it is often the case that older workers also believe the myths, and self-select themselves out of training. "It's a self-image problem; they feel they can't learn" (Kaeter, 1995, p. 64). There is a greater probability that older workers who lack access to training opportunities will find themselves obsolete and, eventually, out of a job than their peers who are able to keep their skills and knowledge current. Between 30 and 40% of workers over 40 years of age feel they need training to update their skills (Kaeter, 1995). One study revealed that workers in the year 2020 will need to be retrained "up to 13 times to keep pace with technological changes in the work environment" (Fyock, 1991, p. 22).

Despite the Age Discrimination in Employment Act (1967), many older workers continue to be denied opportunities for training, development, and promotion in both private and public employment. This situation has developed because of age prejudice and because employers have assumed that most workers would retire before age 65 (National Committee on Careers for Older Americans, 1979, p. 24).

Much ado has been made recently about early baby boomers turning 50. For employers, the number to watch is 40 – when employees become eligible for protection under the Age Discrimination in Employment Act (ADEA). Now that nearly a quarter of [43 million] boomers has reached that magic number, [human resource practitioners] must be even more vigilant about avoiding age-discrimination lawsuits. (Flynn, 1997, p. 105)

Costly litigation

The numbers of individual and class-action lawsuits alleging age discrimination filed by older workers in the U.S. reached a high of 22,800 in the first half of 1992 alone (Hassell & Perrewé, 1995). “If businesses are going to avoid costly litigation, they should recognize age bias and discrimination as a pervasive, escalating issue and immediately expand preventative training on age bias” (ThirdAge, 1998b).

Demographic shifts

One extension of an aging workforce is that stereotypes may change as the sheer number of older workers increase. According to one estimate, more than 50 million workers will need to upgrade their skills to perform tomorrow’s jobs. Of the companies surveyed for the Louis Harris Laborforce 2000 study, 83% expected to expand training programs in the 1990s (Carnevale & Stone, 1994). Demographic factors alone suggest that employers will be forced to confront issues raised by the growing proportion of older workers in the labor force. This demographic imperative may lead to “a more accurate

assessment of their behavior on an individual basis, rather than reliance on an outdated stereotype” (Hassell & Perrewe, 1995, p. 457).

Summary

As the literature suggests, human resource practitioners should be concerned with the effects of workplace ageism for several reasons. Not only are age and ageism frequently central variables in hiring decisions, but ageism can strongly influence the morale and productivity of older workers and their younger counterparts. Ageism can be costly to employers in terms of age discrimination litigation. Furthermore, the changing nature of the workforce age composition may force employers to increase their training investments at the expense of other strategically planned expenditures. Without an understanding of the effects of workplace ageism, human resource practitioners are ill-prepared for effectively troubleshooting the negative outcomes as they occur.

Training Older Workers

Myths and Stereotypes About Training Older Workers

To keep older workers – and their employers – productive, human resource practitioners must confront age-related stereotypes that have germinated in the workplace over the past several decades (AARP Workforce Programs Department, 1993). One such common stereotype of older workers is that “they are slow and are progressively less able to handle intellectual tasks” (Driver, 1994, p. 196). There are other well-entrenched myths about what older workers can and cannot do. Three common myths identified by the Department of Health and Human Services, as cited in Rolander (1988) include:

- Myth 1. Older workers are less productive than the average worker.
- Myth 2. It costs more to prepare older workers for a job than it does for younger workers.

Myth 3. Older workers are unwilling to learn new jobs and are inflexible about the hours they will work. (p. 19)

According to Rolander (1988), the facts that negate these myths are that (a) older workers do meet the productivity goals of their companies, (b) good training programs always consider cost-effectiveness, practicality, and relevance regardless of learner age, and (c) older workers are eager to learn and are no more or less inflexible than the rest of the organization (p. 19).

Employers tend to assume a greater decline in older people's abilities and productivity than reality would indicate; they often anticipate increased illnesses and absenteeism; they are concerned about accident rates and levels of productivity; and they fear that older workers are not willing or able to learn new skills and change existing behaviors (D.A. Peterson & Wendt, 1995, pp. 221-222). Consequently, many companies will not assign older workers to retraining because of these existing stereotypes, which assume that the older worker is less capable, less efficient, less productive, more irritable, and poorer in health. "Surprisingly, these stereotypes are often promoted by employers who are, themselves, older adults" (Baldi, 1997, p. 454).

These beliefs and negative stereotypes are often fostered by past failed experiments. The possibility of failed experiments continues to be a potentially costly risk to misinformed human resource practitioners. These failures bolster employers' reluctance to train older workers.

An example of a failed experiment is the 1973-1978 government project to retrain 2,500 air traffic controllers, whose average age was 45. The program cost over \$100 million, and yielded a success rate of only 7%, based on the number of controllers who

found second careers. The air traffic controllers responded poorly not because they were too old to learn, but rather because the classes were designed for participants in their twenties, not experienced 40-year old males (Carnevale & Stone, 1994).

Misconceptions about training older workers based on past failures is a problem that concerns everyone –“ trainers, supervisors, and workers who are, or someday will be, older members of the workforce” (Gilsdorf, 1992, p. 77). Outplacement consultants estimate that approximately 90% of all executives will need some type of retraining throughout their careers if they are to remain marketable. Many human resource practitioners do not believe that younger and older trainees differ in the psychological needs, physical limitations, and learning styles. They maintain that a good instructor can train anyone using the same methodology, presentation styles, and instructional tools (Mintz, 1986).

In most instances, older employees’ needs are acknowledged in broad, philosophical goal statements, but they are handled poorly at the point of contact. For example, human resource practitioners sometimes view age or previous experiences as a hindrance. The inability of older executives to react like younger, less experienced trainees can complicate the trainer-trainee relationship. Occasionally, when human resource practitioners are misinformed about studies of age differences in performance, the physical limitations of an older trainee, coupled with the time constraints of the program, become an irritant for everyone involved (Mintz, 1986). For example, the use of timed tests, comparing older adults to college students who are “test-wise,” and not using real-world tasks are all examples of “age-bias” factors resulting from studies of age

differences in performance that are often misinterpreted by those who are less knowledgeable (Johnson, 1994).

As human resource practitioners confront age-related stereotypes that have germinated in the workplace over the past several decades, they should be aware that many of these stereotypes are a result of myths fostered by misinformation and failed experiments. Their most effective means of countering the continued proliferation of misinformation about older workers is with research-based fact (i.e., empirically derived data).

As the workforce ages, more and more situations will be created wherein younger managers will be supervising the work of graying adults. It is important that managers of all ages be better educated about facts and figures regarding the work performance levels of older workers; rather than their picking up this information through the informal grapevine, or through their individual biases and selective perceptions accumulated over the years. (Elliot, 1995, p.14)

There exists an entire body of literature about the older worker's responsibility and role in refuting the aging myths and stereotypes, but these studies are beyond the scope of this review.

Research About Training Older Workers

Typical age stereotypes depict an older person as potentially less employable than a younger one, particularly for demanding and challenging positions. The accuracy of these stereotypes is "largely unsupported and contradicted by research on aging" (Goddard, 1987, p. 33). A growing body of evidence clearly disproves many of the myths and stereotypes about older workers. "If science agrees on anything, it is that older people are heterogeneous. This may explain why the term "older worker" keeps being redefined" (Carnevale & Stone, 1994, p. 96). In one study (Hassell & Perrewe,

1995) to determine the extent of managers' knowledge about myths pertaining to older workers and the aging process, over 20% of the participants sampled inaccurately assessed statements about older workers. "To the extent that these inaccurate beliefs are sustained, attitudes about older workers will resist change" (p. 466).

According to Goddard (1987), numerous studies that counteract inaccurate beliefs about aging indicate the following:

1. Generally, older and younger workers show equal levels of productivity.
2. Creative and intellectual achievements do not decline with age.
3. Absenteeism drops as age increases.
4. Older employees display more company loyalty than youthful workers resulting in lower turnover.
5. Older employees have stronger work ethics.
6. Older workers are more satisfied with their jobs, supervision, salary and co-workers.
7. Older people can be trained or retrained as effectively as anyone.
8. Vocabulary, general information, and judgment either rise or do not fall before age 60, and even then continue to develop in the majority of people.
9. Senior workers, if treated with respect, show greater critical judgment, insight, and patience, and in general, are better able to come up with ideas that work. (p.33)

"These research findings indicate that America has been squandering a major source of productivity for years" (Goddard, 1987, p. 34). According to Barth et al., (1995), research on the productivity of older workers falls into two categories: "(a) industrywide or occupationwide studies of the performance of workers in different age

cohorts using general measures of productivity, and (b) case studies of individual companies using older workers” (p.38). Arthur, Fuentes, and Doverspike (1990) assessed the relationships among test performance, age, and job performance and found that, when age differences in job performance occur, “they can better be explained by performance on valid predictors rather than age per se” (Arthur et al., 1990, p. 11). Other studies comparing performances between young and older adults in the work setting found that older adults typically perform better than 30% of the young adults. Older workers show great variability in the ability to perform competently (Baldi, 1997, p. 454).

More than 25 years of gerontological research (Mintz, 1986) has provided important information regarding cognitive ability and aging. Barkin (1970) maintained that “older persons can be trained, and the scientific research carried on since the 1920s has reinforced this conclusion” (p. 20). For example, older trainees differ from younger ones in terms of their psychological needs, physical limitations, and learning styles. Older adults experience problems processing information when it is presented at a fast pace, when contextual cues are not provided, and when the individual cannot consider competing information provided simultaneously (Mintz, 1986). Although many age-related deficits have been identified (visual and auditory functions decrease on average with age), close to 90% of perceptual functioning remains intact (Mintz, 1986).

D.A. Peterson and Wendt (1995) listed other rebuttles from gerontological research to stereotypes about older workers:

1. Older workers remain a stable element in the workforce.
2. Older workers are more involved in their jobs than younger workers.

3. Human relations executives also believe that skill training for older workers can be effective, although a limited number have implemented such programs.
4. A significant body of research has indicated a substantial learning ability for healthy persons at any age. (p. 222)

For many work-related cognitive abilities, such as working memory, there are no age variations across the years. “Older adults can learn as well as younger individuals, but it will probably take them more time” (Sterns & Sterns, 1995, p. 22). According to the authors, research on crystallized and fluid intelligence has enriched our understanding of the “differential changes that may be taking place in individuals as they age” (p. 24).

“Research over the past 40 years on the physiological and mental capabilities of older adults has documented their sustained intellectual capacity” (Bass, 1995, p. 1). Results from early research in the 1930s and 1940s suggest that findings of severe intelligence diminution with age occurred because different age cohorts were compared in cross-sectional studies (Driver, 1994). Longitudinal studies of the same people revealed slight gains in verbal skills --- vocabulary, similarity judgments, and critical thinking – and stability in other areas well past the former retirement age of 65 (Driver, 1994; Schaie, 1990).

Research on memory and learning ability is inconclusive, but work in the 1980s and later suggests that if older people are healthy and motivated, then memory and learning problems are nonexistent or mild. Mental disorder, or dementia, does not become frequent until past age 75 (20% incidence), and the disorder does not become a real problem until past 85 (50% incidence). The one area where deficiencies occur with age is in speed of information processing. (Driver, 1994, p. 196).

According to Shields, Hentges, and Yaney (1990), changes associated with normal aging are separate from changes associated with dementia (e.g., a slightly slower

mental reaction rate, or delayed comprehension, which may be more related to sensory input problems). In one study, Schaie (1990) found that the incidence of significant decrement was quite limited until age 60, and affected less than a third of the study participants until age 74. By 81 years, only 30% to 40% of the persons studied were affected.

According to Howard (1994), aging itself does not have a large impact on deterioration of brain function. The primary assailants on neurons include the following: “(a) medication, (b) disease (especially heart disease), (c) extended grief over personal losses, (d) alcohol, (e) a sedentary lifestyle, (f) lack of stimulation, (g) educational level and absence of a desire to learn, (h) malnutrition, and (i) depression” (p. 59).

The author wrote that two clear trends associated with the aging brain are that “(a) between the ages of 20 and 60, reaction time slows; and (b) performance improves with age among those who use their brains, and declines among those whose brains retire when they retire from their jobs” (pp. 62-63). Employers should consider the physical changes of aging, particularly lower vision and hearing capability. A training environment with “reasonable lighting and sound systems, comfortable temperature and seating, and clear and safe walking surface would compensate for most of the physical problems” (Shields et al., 1990, p. 3).

Rosenthal’s initial report (Rosenthal & Jacobson, 1968) has been followed by 20 years of research exploring the limits of the self-fulfilling prophecy. Current thinking is that one can influence his or her performance level and that of others by one’s level of expectation (Howard, 1994). For example, negative stereotypes of the computer illiterate older adult have not been supported by the research. Older adults’ attitudes toward the

computer do improve with positive experiences with the computer. Also, training studies show that older adults can learn how to use the computer, but need approximately twice as long to complete training as young adults (Baldi, 1997; Kaeter, 1995).

It is clear that healthy and presumably well-motivated older individuals are fully capable of training to adapt to current and emerging technologies. Garfein, Schaie and Willis (1988) reported that the findings of their study “do not support some of the common negative stereotypes of older learners previously thought to be incapable of, and resistant to, retraining” (p. 131). Another study (Hayslip et al., 1996) refuted the stereotype that older workers cannot adjust to a work team environment (i.e., team training involving older workers).

Other training success stories that refute the myths and stereotypes associated with training older workers exist:

Triton International Management Consulting’s San Francisco Project (Shaver, 1977). The project clearly demonstrated that skills and knowledge do not become obsolete but have a life expectancy far exceeding usual assumptions.

General Electric (Fyock, 1991). The company reported that it is cheaper to retrain veteran engineers than to hire new engineers.

Days Inn (Kaeter, 1995). Today the company is such a fan of “unretired” employees that its properties sponsor seminars that tell other employers how to use this group of workers. “Some of their highest performing salespeople are over 65” (p. 63).

Travelers Companies in Hartford, Connecticut (Kaeter, 1995). This company maintains a bank of about 500 registered former employees, as well as retirees drawn

from the community at large. During any given week, about 140 work part-time or on short-term projects. “Their pay is based on skills and experience” (p. 63).

Motorola Corp. (Kaeter, 1995). This company draws from its retired employees’ institutional memories as a “boon to its training programs” (p. 63).

There have been relatively few studies of the posttraining performance of older persons. However, from their research Doering, Rhodes, and Schuster have concluded that that “the outcomes of training the older worker are better than when training the younger worker” (as cited in D.A. Peterson & Wendt, 1995, p. 230).

Techniques and Methods for Training Older Workers

The purpose of providing an overview of techniques and methods for training older workers is to show that such instructional models exist, have been used successfully, and can produce significant performance results. The existence of these instructional models refutes the stereotype that “old dogs can’t learn new tricks.” If ageist attitudes and behaviors can be put aside, the question is not, Can older adults learn? Rather, the question is that which Baldi (1977) wrote “What is the best and easiest way to teach them?” (p. 463).

One concern, mentioned by Carnevale and Stone (1994), is that retraining options might place older workers into formal classroom environments, where they often feel uncomfortable and inadequate. In addition to the type of physical learning environment, D.A. Peterson, and Wendt (1995) cited several reasons why older learners are typically not as efficient at learning as their younger cohorts. These reasons include the following:

1. Older learners have typically not been involved in learning situations in a number of years and have forgotten how to learn effectively,

2. Older learners may need help with study skills like reading, note taking, reviewing, and organizing study materials,
3. Older learners need a supportive class atmosphere that allows them to succeed and gives them positive feedback,
4. Older learners need to see the relevance of the educational situation to their jobs and understand specific ways of applying it to the work situation,
5. Older learners prefer instruction that draws upon their experience and builds on that expertise,
6. Older learners often prefer instruction that is self-paced or modified to accommodate their needs,
7. Older learners need classrooms and seating arrangements that facilitate being able to hear the speaker and see the speaker's face,
8. Older learners respond more positively to an instructor who is sensitive to their needs for clarification, repetition, and application,
9. The learning environment needs to be free of distractions and provides opportunities for frequent breaks and social interaction. (p. 233)

While age-related changes may limit older learners, they are not in themselves disabling. It is the effects of these changes on the level of achievement motivation that are often disruptive. Litwin (1970) proposed that “the occupational problems created by a decline in achievement motivation, or need for achievement (abbreviated *n* ach.) are correctible through appropriate education and supervision (i.e., achievement motivation training)” (p. 62). The author’s achievement motivation training attempted to accomplish the following:

1. Encourage self-confidence – through a systematic attempt to induce the belief that the participant can increase own achievement motivation if he wants;

2. Stimulate and reinforce achievement thinking - by learning to use categories of thought and feeling that are known to be characteristic of people with high need for achievement;
3. Elicit and reinforce achievement oriented behavior – through games and simulations, participant is encouraged to behave in ways characteristic of people with high need for achievement;
4. Develop self-understanding – through self-analysis of thinking patterns and behavior;
5. Encourage personal goal setting and planning – by setting specific measurable and realistic personal goals and to develop realistic plans for achieving those goals;
6. Provide group supports – participants establish close personal relationships with each other. (pp. 65-66)

D.A. Peterson and Wendt (1995) suggested that “motivated older individuals can acquire new facts, skills, behaviors, and attitudes, but specific adjustments in the instruction given to them must be made for learning to be most effective” (p. 233). Climates that encourage the development of achievement motivation are those that generally “(a) allow considerable personal responsibility, (b) reward excellent performance, (c) encourage risk taking and innovation, and (d) create a strong sense of group identity and team spirit” (Litwin, 1970, p. 68). Fyock (1991) offered specific guidelines for accommodating the common age-related needs of older trainees:

1. Design easy-to-read training materials (high-contrast colors and large, bold typefaces).
2. Allow self-paced learning.
3. Eliminate high-gloss items and avoid posting training materials above eye level (hard for people with bifocals).
4. Speak clearly and distinctly. Remove distracting sounds.

5. Break skills into small tasks and then build upon that knowledge.
6. Use modular training programs – a building block approach to facilitate learning.
7. Eliminate jargon – creates barriers and perpetuates a “we/they” mentality.
8. Use multiple training methods.
9. Use printed training materials (older adults tend to place credibility on the printed word) and allow older trainees to take work home to study and review.
10. Use video training and make sure older trainees are comfortable with operating the video equipment.
11. Use older adults to teach older adults older instructors know how to adapt the environment to meet older learners’ needs, and can be confidence boosters).
12. Group older learners together in the learning process.
13. Build on valuable life experience.
14. Link learning with rewards. (pp. 22-23)

A recent study released from the University of Illinois at Urbana-Champaign shows that older people can be taught new skills or enhance old ones more easily than previously believed using a variable-priority technique (vs. traditional fixed-priority technique) that was used by U.S. and Israeli fighter pilots in the last decade to heighten their abilities on multiple and oftentimes simultaneous tasks (Barlow, 1997).

Another method that has been used successfully for training older workers for the past 30 years is the Discovery Method (Baldi, 1997; Belbin, 1969; Sterns et al., 1994). The Discovery Method attempts to increase motivation by allowing the individual to “discover firsthand how and why things work” (Baldi, 1997, p. 461).

Johnson (1994) developed a list of “Do’s and Don’ts” for trainers to use when working with older adults:

1. Don’t let research on memory and aging bias you.
2. Don’t give older adults meaningless material or tasks.
3. Don’t put undue pressure on older adults with timed tests or exercises.
4. Don’t tell them how to do something. (Creativity doesn’t decline enough to make a difference in contribution; George Bernard Shaw wrote several plays when he was in his 90s).
5. Do treat them as individuals.
6. Do present one idea at a time.
7. Do use mnemonics, memory aids and any other tools to help learners organize information.
8. Do use teams when possible to solve problems.
9. Do summarize frequently.
10. Do learn from them. (p. 34)

Jones (1984) offered nine tips for training older workers:

1. Determine the educational level of the older worker and adjust your training design accordingly. An older worker with less than a high school education will be motivated to learn by concrete, real life examples. He or she will want immediate results. Teach, practice and immediate application.
2. Design training programs using old skills and old ways to teach the new skills and new ways.
3. Involve older workers in planning, designing and evaluating training programs.
4. Use peer teaching, small group work, and lots of discussion and Q&A.
5. Allow more time for practice and skill acquisition.

6. Impact on knowledge acquisition will be seen in older workers who have been given on-the-job opportunities to keep mentally active.
7. Include activities that stimulate and motivate through involvement, such as case studies and problem analysis.
8. Provide various ways to learn: verbal instruction, role modeling, opportunities for practice.
9. Use older workers' judgement and reasoning abilities to summarize training program and to help sell it to others. (p. 12)

Summary

Training is essential to maintaining or enhancing the value of aging human capital in today's organizations. However, workplace ageism is often the factor that prevents older workers from gaining access to training opportunities in order to keep their knowledge and skills current. Human resource practitioners are tasked with refuting the prevalent myths and stereotypes about the effects of aging on learning and work behaviors of older workers. To dispel the myths and redress ageist beliefs, they need research-based facts about training older workers. They need to design programs and learning environments so that the age-related needs of older learners can be accommodated. Armed with accurate information and age-appropriate environments, human resource practitioners are better positioned to help their employers maintain a productive and competitive aging labor force.

Experiential Learning Theory

Two types of interventions that have been used successfully to heighten awareness among healthcare and social service providers about the accuracy of their beliefs and attitudes toward older adults is simulation games and role-playing. These research-based interventions have been used successfully in gerontological education to

refute negative stereotypes and myths about aging. A more detailed discussion about the use of simulations games in gerontological education is presented later in this chapter.

If simulation games and role-playing have been used effectively to heighten awareness about ageism in one discipline, could they be used as effectively to heighten awareness about ageism in other disciplines? In order to understand how simulation games and role-playing could be similarly used by human resource practitioners to redress workplace ageism, it is helpful to review experiential learning theory from which these interventions are derived.

Pfeiffer and Ballew (1988a) wrote that “experiential learning occurs when a person engages in some activity, looks back at the activity critically, abstracts some useful insight from the analysis, and puts the result to work through a change in behavior” (p. 3). This is considered an inductive process (i.e., that which proceeds from observation) rather than a deductive process (i.e. that which proceeds from a priori truth). The authors categorize experiential learning events as structured experiences, or those experiences which “provide a framework in which the inductive process can be facilitated. The participants discover meaning for themselves and validate their own learning” (p. 3). In order for any learning activities to be effective in helping adult participants discover meaning for themselves and validate their own learning, Caffarella and Barnett (1994) suggested that those who facilitate the learning event (i.e., educators and trainers) should “be cognizant of the characteristics and needs of adult learners” (p. 30).

Characteristics and needs of adult learners

What is helpful for adults in any learning situation is to have facilitators or instructors (a) assist them in matching their preferred learning styles to learning techniques, and (b) use a variety of learning techniques “so that all learners feel that their strengths are being tapped at different points in the process” (Caffarella & Barnett, 1994, pp. 31-32). The “idea that nothing is more relevant to us than ourselves” is the reason why experiential learning is effective (Pfeiffer, 1995, p. 209). According to Lewis and Williams (1994), “Experiential education first immerses adult learners in an experience and then encourages reflection about the experience to develop new skills, new attitudes, or new ways of thinking” (p. 5).

This principle of experiential education aligns with models of good practice in adult education. In order to enhance current and future learning, learners’ previous experiences are utilized in the cognitive event. “Experiential approaches appear to be more effective in developing skills that employers seek” (p. 6).

Experiential models are being applied more widely than ever in business and industry because experiential learning legitimizes acquiring self-knowledge. Learners now have a mandate to see, learn about, and examine their own unique situations in action as they interact with others at work. (p. 10)

“People can become better learners by acquiring a repertoire of attitudes, skills, and understandings that allow them to become more effective, flexible, and self-organized learners in a variety of contexts” (p. 15).

Experientially induced change

Within this changing social and economic climate, employers will increasingly need diversity and equity training to enhance the interpersonal and intercultural

communicative effectiveness and, ultimately, the productivity of their work forces. If training programs are to promote meaningful behavior change, “it is imperative that the learning activities engage participants in a process in which new perspectives and information are learned in relation to each learner’s own personal tasks and needs” (Bassett & Jackson, 1994, p. 83). According to Allport (1958), “A person’s conduct proceeds immediately from his view of the situation confronting him. His response to the world conforms to his definition of the world” (p. 210). Therefore, based on Allport’s definition, it logically follows that experientially-induced change occurs when a person’s definition of the world is changed through experience.

Some kind of active experience is fundamental to all learning. According to Thatcher (1990), “The learner has to be active and involved with the material or skill to be learned in some kind of experience” (p. 264). Being actively involved with the material typically involves both the cognitive and affective domains of instruction. About the cognitive and affective domains Thatcher (1990) wrote the following:

These two domains are closely interrelated and much cognitive learning is either promoted or inhibited by the affective elements present for an individual in a learning process. It is possible that the learning outcome of an experience for different individuals may be very different as a result of the feelings which were present or developed in the experience. Because all games and simulations are a form of experiential learning, the learners or players are actually engaged in an experience. (Thatcher, 1990, pp. 267-268)

Summary

The most basic premise of experiential learning theory is that experiences are structured in such a way that the participants gain meaningful insights about themselves. “Knowledge of oneself, research shows, tends to be associated with tolerance for others”

(Allport, 1958, p. 408). Consequently, if work environments are to become more age-tolerant, then human resource practitioners must find ways to help employees gain meaningful insights into their own misperceptions and stereotypical beliefs about older workers. Experiential learning is, therefore, a suitable theoretical framework from which appropriate interventions can be developed.

Learning Style

Using the appropriate theoretical frameworks is only one step in the process of designing effective interventions that facilitate meaningful behavior change. Without appropriate attention paid to the learning styles of the participants, even the most powerful intervention is at risk of being added to the list of “failed experiments.” A review of the literature pertaining to learning style is presented here.

Caffarella and Barnett (1994) wrote that “each adult learner brings to the learning situation his or her own style of learning” (p. 31). The authors defined learning style as “a person’s preferred way of processing information within specific learning situations. One way to describe learning style is by targeting through which senses learners appear to learn best” (p. 31).

Another way to think about learning style, as proposed by Endorf and McNeff (1991), is through the idea of learning types. Endorf and McNeff drew a picture of learning types as a complex interaction of learners’ histories and personalities. These interactions lead to preferred differences in learning. For example, some adults would rather learn in groups with a great deal of instructor direction, whereas others prefer to be more self-directed, even when working in groups (Caffarella & Barnett, 1994, p.31).

Learning style is described as a set of “traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment” (Given, 1996, [On-line]. Available: <http://crab.rutgers.edu/Camden/TEC/JALT/SpringHTMLJALT/SpringJALT.html>). Curry’s (1987) onion metaphor (as cited in Given (1996)) aptly described the stability or entrenchment of particular learning style domains. The parts of the onion represent the following:

1. Personality dimensions comprise the core of the onion because they are the least resistant to change.
2. Information processing dimensions comprise the middle strata since they influence and are influenced by personality dimensions
3. Environment/instructional factors comprise the outer strata since they are most susceptible to change. ([On-line]. Available: <http://crab.rutgers.edu/Camden/TEC/JALT/SpringHTMLJALT/SpringJALT.html>)

In a 1988 behavioral study (i.e., Augsburg Weekend College in Minneapolis, Minnesota) to assess how students perceive their roles as students, Endorf and McNeff (1991) identified five types of adult learners through Q-sort technique (a qualitative, descriptive study):

1. Confident – pragmatic, goal-oriented self-sufficient, eager to work with peers.
2. Affective – respond to affective elements of learning “feeling of the environment and relationships with peers and instructor”; cooperative in meeting instructor’s expectations.
3. Learners-in-transition – not fully developed educational goals; still developing independence as students; school is a serious matter.

4. Integrated – sees life and career as integrated; while enjoying the accomplishments of new learning, interested in personal success; take personal responsibility for learning.
5. Risk Taker – willing to take risks to accomplish educational goals; will happily stray from course guidelines if there is an opportunity to learn new knowledge. (pp. 21-22)

Given (1996) categorizes hundreds of approaches or models to learning style into one or more of the following five categories: (a) Emotional/Personality Models, (b) Sociological Approaches, (c) Information Processing Approaches, (d) Physical Approaches, and (e) Environmental/Instructional Approaches. The author found that “based on the meta-analysis of experimental research findings discussed, adult learners responded with greater gains than elementary or secondary school learners when instruction was matched to their preferences” ([On-line]. Available: <http://crab.rutgers.edu/Camden/TEC/JALT/SpringHTMLJALT/SpringJALT.html>).

Summary

Because experiential learning events are designed to maximize personal meaningfulness to individual learners, learning style theory helps human resource practitioners match instruction to the preferences of their target audience. By doing so, they can increase the probability of realizing greater gains in heightened awareness among their adult participants.

Simulation Games and Role Playing

Dickinson and Faria (1997) wrote that

[The] relative merit of simulation games versus other teaching approaches has been investigated by a number of researchers, and across all studies, simulation games were found to be more effective than conventional instructional methods in 75 of the comparisons, and no differences were reported in 58 of the comparisons. The reported studies included business as well as social science simulations. (p. 264)

Faria (1987) (as cited in J. J. Kirk, 1997) found that “more than 50% of the companies in the United States used some type of game or gaming simulation in their training” (p. 88). Bredemeier and Greenblat (1981) (as cited in J. J. Kirk, 1997) wrote that games “are used to train employees at all levels of the organization for a variety of purposes [to bring about] changes in feelings and attitudes” (p.88).

It is important to note that a simulation is not always a game. Most experts agree that the distinction between a simulation and a game is that the latter includes the element of human interaction as well as the necessary structure that defines how the game is to be played. “A simulation is a representation of one system by means of another system that behaves similarly to the original” (Pfeiffer & Ballew, 1988a, p. 62). The purpose of a game is to involve the players in the operation. “The system and/or environment in a game need not be a model of an actual one; it can be a composite or a totally fictitious one that is similar to those encountered in real life” (Pfeiffer & Ballew, 1988a, p. 62).

According to the author, the following are three different types of learning that are often present in a simulation game:

1. Learning the facts (or concepts or generalizations or skills) expressed in the game context and dynamics
2. Learning the processes simulated by the game

3. Learning the relative costs and benefits, risks and potential rewards of alternative strategies of decision-making. (Thatcher, 1990, p. 268)

In simulation games, Thatcher (1990) considered the debriefing to be the most important point of learning. The debriefing “is the process by which the experience of the game/simulation is examined, discussed, and turned into learning”(Thatcher, 1990, p. 270). According to Walter and Marks (1982), there are three factors that interact to “dramatically affect participant behaviors” (p. 174). The three factors are: (a) the level of energy, (b) the feelings participants hold about themselves as they enter the experience, and (c) the feelings generated in response to the learning experience (p. 174).

In contrast to other types of training interventions, Specht and Sandlin’s (1991) study compared the effects of one experiential learning exercise used in an undergraduate accounting class with the results attained when a traditional lecture method was used in another class.

[The] results revealed no significant differences in short-term learning between the two classes; however, the experiential class experienced no significant differences in quiz scores over time, while there was a significant decrease in the scores of the lecture class over a six-week period. These findings indicate the key difference in the two learning methods is the students’ retention of the concepts over time. (p. 196)

Role playing can be incorporated in both simulations and simulation games.

According to Pfeiffer and Ballew (1988b), role playing is defined as the following:

A technique in which people are presented with roles in the form of a case or scenario, then act out the roles in order to experience them for educational purposes. The ways in which these roles were approached by the role players then is discussed, and the action may or may not be tried again. Role playing is, then, a spontaneous human interaction that involves realistic behavior under artificial or “imagined” conditions. (p. 4)

Pfeiffer and Ballew (1988b) suggested that there are three reasons why role playing might be incorporated in experiential learning events:

1. to practice behavior in preparation for a new role or an anticipated problem situation,
 2. to examine a problem situation or past incident in order to learn how it could be/have been handled better, and
 3. to create insight into the motivations and roles of others or oneself.
- (p. 4)

To heighten their participants's awareness about their own beliefs and attitudes toward older workers, human resource practitioners might incorporate role playing in any experientially-based learning interventions designed to redress workplace ageism.

A human being thinks, acts, and feels at the same time, but the three processes may not be congruent. The most effective way to communicate with or teach a person is to reach the totality, the thinking, feeling, and behaving parts of the individual. Role playing offers the opportunity to practice one's human relations skills in a lifelike setting, to experiment and try out new behaviors without running the risks that such experimentation entails in real life. (Pfeiffer & Ballew, 1988b, p. 5)

The authors wrote that the unique values of role playing include the following:

1. It requires the person to carry out a thought or decision; it demonstrates the difference between thinking and doing.
2. It permits practice in carrying out an action and allows people "another shot" at it.
3. It makes clear the fact that good human relations require skill in the same sense that playing golf requires skill.
4. It accomplishes attitude changes effectively by placing people in specified roles, demonstrating that a person's behavior is not only a function of his or her personality but also of the situation in which she or he happens to be.
5. It trains a person to be aware of and sensitive to the feelings of others.

6. It develops a fuller appreciation of the important part played by feelings in determining behavior in social situations.
7. It enables people to discover their personal faults.
8. It permits training in the control of feelings and emotions. (pp. 6-7)

Simulation games that incorporate role playing can optimize learning approaches dealing with complex situations. According to Peters et al. (1998), three principles govern the design process of a game:

1. Reduction – we make a selection of elements from the reference system that have to be included in the game model: we include the elements that seem relevant to us and leave out the elements that are less important.
2. Abstraction – implies that elements included in the game model are not necessarily as detailed as they are in reality: we deliberately simplify them to make our model less complex.
3. Symbolization – deals with the fact that the elements and relations of the reference system are molded into a new symbolic structure, namely, into scenario, roles, rules, and symbols, which are the most important basic elements of a game. (p. 27)

Errors that can be made in the design process include the following:

1. We can wrongly decide to leave out some very essential elements or relations from the simulated model, or we can include elements of minor importance in it; both errors result in the wrong aspects being emphasized in the game model.
2. We can introduce elements that are too vague or too detailed, which could have the same result
3. We can transform elements into such a symbolic structure that the participants fail to see the link with the reference system. (Peters, Vissers & Heijne, 1998, p. 27)

Causes of errors made in the design process (threats to validity) include the following:

1. Designer fails to take full account of the objective of the game
2. Designer lacks thorough knowledge of the reference system – thus making wrong decisions about the inclusion and exclusion of game elements.
3. Designer being too strongly focused on the game model and the eventual game thus being guided by the opportunities and/or restrictions of the game instead of by the features of the reference system and the objectives of the game. (Peters, Vissers & Heijne, 1998, p. 28)

Simulation Games in Educational Gerontology

In the absence of any comparable literature in business or human resources, gerontological literature provided the benchmark for the present study. A number of studies in gerontological research have yielded significant results by incorporating experiential learning events.

Shenk and Lee (1995). Meeting the educational needs of service providers: Effects of a continuing education program on self-reported knowledge and attitudes. The authors noted an increase in participants' factual knowledge about aging at the completion of the program.

Babic and Crangle (1987). Simulation techniques for education in gerontology: An exercise in experiential learning. This study described some of the aspects of a quasi-experiment that had been developed over several years as part of an undergraduate "Intro to Gerontology" course. The results of simulations yielded by a sample 170 undergraduate students were analyzed for this study. The authors argued that the major issue surrounding the use of a simulation is that a number of gerontology educators

believe it places too great an emphasis upon losses and the negative aspects of growing old. In terms of this study, little evidence was found to support their contention.

Gardner and Benzing (1990). Age-related sensory changes: Using simulations in geriatric education. In this study, Gardner and Benzing presented a rationale for using simulations, experiential activities, and games in geriatric education.

Mosher-Ashley (1995) presented a review of the literature on the use of simulations in gerontological and geriatric training.

Aday and Campbell (1995). Changes in nursing students' attitudes and work preferences after a gerontology curriculum. Aday and Campbell found a significant relationship between attitudes toward the elderly and perceptions of caring for the elderly. This finding pointed to the relationship between attitude towards and perceptions of caring (overt behaviors) for the elderly.

Tiemann and Stone (1992). Projective aging: An engaging technique for teaching issues in growing older. This article presented a teaching technique to help students think about what it means to grow old. In this directed experiential learning situation, students evaluated issues and myths associated with the aging process by imagining their own aging, describing themselves as "old" people, sharing their images, and discussing the realities of aging. Throughout the process, students were actively involved in their own learning.

Reed, Beall and Baumhover (September 1992). Gerontological education for students in nursing and social work: Knowledge, attitudes, and perceived barriers. This research suggested that students entering service professions that require working with the elderly are aging-knowledge deficient and lack positive attitudes toward older people.

According to Katz (1990), research on the use of gerontology education as a change agent of attitudes toward aging has yielded mixed results – primarily due to the multiple dimensions of attitudes measured by diverse attitude instruments. While one study shows an increase in negative attitudes following gerontological coursework, the findings of another study indicate that introductory gerontological coursework can be “an effective tool for increasing positive attitudes toward older people” (Katz, 1990a, p. 96).

Carmel, Cwikel, and Galinsky (1992) evaluated the short-term and long-term effects of different educational methods in gerontology and geriatrics on knowledge, attitudes, and work preferences among students. The study sample included more than 100 students studying medicine, nursing, and social work in Israel. The results show that an increase in knowledge about the elderly does not necessarily lead to positive changes in attitudes and work preferences.

Intrieri et al., (1993) examined the effect of an experimental program in gerontology and geriatrics on the knowledge, attitudes and interview skill behaviors of 3rd-year medical students. Experimental group members (n=45; controls n=51) participated in four 90-minute group sessions that emphasized psychological, sociodemographic, and physiological aspects of aging and interpersonal communication skills. Program participants developed more positive attitudes and demonstrated more socially skilled behavior during an interview with an older adult. The results of evaluations of the effectiveness of such courses on changes in knowledge and attitudes have been inconsistent. Carmel, Cwikel, and Galinsky (1992) attributed these diverse findings to the different teaching methods and measures used in teaching gerontology reported in the literature (i.e., (a) formal lecture courses to increase the level of

knowledge, (b) group discussions on attitudes and feelings about older persons, or (c) informal contacts with both well-functioning and ill older persons).

The authors found that the method of teaching that significantly affected knowledge level was formal lectures. The change in level of knowledge, however, was not expressed in further changes of attitudes and work preferences. “The increase in knowledge after the courses among those who already had a previous relationship with an elderly person suggests that a positive emotional predisposition can provide a fertile base for increasing knowledge even though it did not affect work preferences or attitudes” (Carmel et al., 1992, p. 337).

Most evaluations on the effectiveness of courses about changes in knowledge and attitudes have primarily focused on the short-term effects immediately following the course.

Because attitudes are deeply rooted in cognitive entities, there is reason to believe that short-term achieved changes can diminish over a longer period of time, or alternatively, that null short-term effects on attitudes can become positive in the long-run after students have time to better absorb the new information. (Carmel et al., 1992, p. 331)

According to the authors, “attitudes and work preferences are a product of complex socialization processes crystallized over a period of time, and, therefore, cannot be expected to change after exposure to a short course in gerontology” (p. 338).

Another study (Markson, Pratt, & Taylor, 1989) described the design and evaluation of a continuing education program in gerontology for executives and professionals who provide products and services to the elderly and who are often unaware of the needs and concerns of elders. Because “few gerontologists have tailored programs for business audiences” (Markson et al., 1989, p. 285, the purpose of the

authors' study was to identify and correct stereotypical images of older consumers among business people who sell goods and services to older people. A total of 119 persons paid for and received training in these workshops. Project organizers tested the registrants before and after the workshops on their perceptions of older people. They found that more people gave correct answers to a range of questions about the elderly after they completed the workshop training.

Another program (Intrieri et al., 1993) provided instruction in basic aging facts and then required students to implement a psychosocial intervention with an older person. There was minimal change on an attitudinal questionnaire used in the study. According to the authors, "programs developed simply to increase knowledge of normal aging with the hope of improving attitudes toward the old have had limited success" (p. 374).

Perhaps the real question raised by researchers who emphasize the limitations of educational gerontology as a change agent is, Are professional curricula providing students with adequate training to serve the current needs of this population, and to meet the projected increases in demand for services? For example, in Reed, Beall, and Baumhover's (1992) study, 67 master's students in nursing and social work completed questionnaires assessing (a) knowledge about aging, (b) attitudes toward old people, and (c) perceived barriers to gerontological education. Results confirmed the existence of knowledge deficits among respondents. Attitudes tended to be neutral rather than positive or negative. Knowledge scores were related to attitudes, to respondents' ages, and to their having lived in households with older relatives. Nursing students identified the greatest barriers in gerontological education as insufficient curriculum time and lack of academic role models. Social work students perceived a lower status of work with the

elderly and limited experience with healthy older people as the greatest barriers. The authors' findings suggested "a need for didactic and experiential learning opportunities, reinforced by appropriate role models, for students in service professions" (p. 625).

Summary

The psychology of ageism is a social psychology. Understanding the psychology of ageism leads to a greater awareness of and ability to recognize its effects on human behavior. Human resource practitioners who can recognize the effects of ageism in their own and other's behaviors are better positioned to effectively redress ageism in the workplace. The first step in understanding the psychology of ageism is understanding the nature of prejudice. Allport's theory about the nature of prejudice, commonly cited in gerontology literature, is a widely accepted foundation for the psychology of ageism.

The contributions of older workers to the American economy are "under-appreciated because of long standing prejudices" (Barth et al., 1995, p.38). These long-standing prejudices are evidenced by personnel and training policies in a number of organizations throughout the United States. In these organizations, ageism operates as a belief that older workers have fewer resources to exchange for a job. The under-utilization of older Americans as workers – both those currently working and those wanting to work – transcends economic rationalizations and prejudice.

CHAPTER 3

METHODS AND PROCEDURES

Research Design

This chapter describes the procedures and methods used to answer two research questions about the effects of an experiential training intervention on knowledge and attitudes toward older workers. The purpose of this investigation was to examine the effects of a simulation game on trainee's knowledge and attitudes about the age-related changes in the learning and work behaviors of older workers. It was conducted in response to the need for effective diversity awareness programs to help employers create intergenerational friendly work environments. The research questions answered by this investigation are as follows:

1. Will participants who play the Into Aging simulation game (treatment) score significantly higher on the ALWQ (knowledge measure) than participants who receive the traditional classroom lecture method of instruction?
2. Will participants who play the Into Aging simulation game (treatment) experience a more significant change in attitude as measured by the AGED Inventory (attitude measure) than participants who receive the traditional classroom lecture method of instruction?

The training intervention examined is a role play game modeled after a published simulation game (Dempsey-Lyle & Hoffman, 1991) that has been used effectively in gerontological education, as cited in chapter 2. Dempsey-Lyle and Hoffman's game was selected for this study because a review of the literature revealed a dearth of empirically proven games with comparable objectives suitable for use in a workplace environment.

The modifications made to the game structure and elements are discussed in the Procedure section of this chapter.

The target population examined in this study comprises current and future human resource management and development practitioners. The sample for this study came from an applicant pool of representatives located in the Dallas/Fort Worth Metroplex.

The research method used was an experimental pre- and posttest control group randomized block design, as shown in Figure 1.

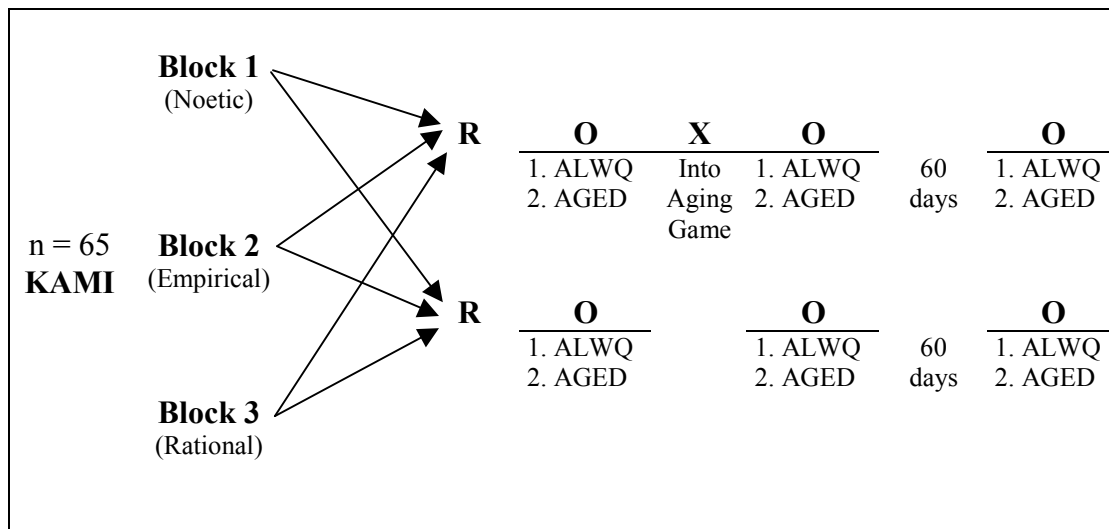


Figure 1. Research design (Huck, Cormier, & Bounds, 1974).

Random assignment was used to strengthen the sensitivity of the design in response to subject heterogeneity (Lipsey, 1990) and to allow the researcher to “assume pre-experimental approximate equality of the two groups in all possible independent variables” (Kerlinger, 1986, p. 326).

Based on evidence cited in chapter 2, blocking was used to control for possible adverse effects between the independent and dependent variables. Prior to the experiment, participants were measured, blocked, and randomly assigned to treatment and control groups based on their learning style preferences. The treatment group received a modified version of the simulation game, Into Aging. The game was modified to ensure content validity as it was applied to the target population sampled in this study. The control group received a traditional classroom lecture comprising the equivalent of content presented in the simulation game. Both groups were measured on the dependent variables immediately prior to treatment, immediately following treatment and approximately 60 days after the workshop. The 60-day posttreatment measure was added to determine whether or not the treatment effects would be stable over time.

Statistical Analysis

The statistical analysis used in this experiment was the Analysis of Covariance General Linear Model (ANCOVA-GLM) with Repeated Measures. Use of the ANCOVA procedure was appropriate for this design because according to Huitema (as cited in Loftin & Madison, 1991), it affords the researcher certain advantages: (a) its power against Type II error is generally greater than analysis of variance (ANOVA), and (b) it reduces the bias caused by variations between experimental groups that existed prior to treatment.

Use of the ANCOVA with Repeated Measures procedure yielded significant ($\alpha = 0.05$) between-group differences in the scores generated by the ALWQ Post 1 and Post 2 (cognitive measure), but the differences did not occur in the direction stipulated by the alternative hypothesis (see chapter 4). The control group outperformed

the treatment group by one standard deviation, instead of the other way around, which was the expected outcome. Possible explanations for this finding are discussed in the Conclusions section of chapter 5. No significant between group differences at the 0.05 alpha level were detected in the scores yielded by the AGED Post 1 and Post 2 (affective measure) (see chapter 4). However, the within-group differences that occurred during the 60-day interval of time between the Post 1 and Post 2 administrations of both measures were significant at the 0.05 alpha level. The control group's scores on the ALWQ indicated a large disordinal interaction effect that occurred within the group during the 60-day interval. Possible explanations for the unexpected finding are discussed in the Conclusions section of chapter 5.

Power

Cohen's (1977) a priori power analysis program was used to calculate the sample size needed to produce the required power for detecting the effect sizes specified in this investigation. As indicated in Table 1, the statistical power for this design was estimated to be 0.927. The calculation was based on a total sample size of 50 ($n = 25$ per group), an alpha level of 0.05, and an acceptable minimum effect size of $\Delta = 0.50$.

Table 1

Power Analysis for a 2x2 Factorial Analysis of Variance (Cohen, 1977)

Factor	Number of levels	N per level	N' per level	df	$ES = f$	$1-\beta$
Factor A	2	25	24.0	1	.50	0.927
Factor B	2	25	24.0	1	.50	0.927
A * B			24.0	1	.50	0.927

Total $N = 50$; Number of Cells = 4; Mean per cell = 13; $\alpha = 0.05$.

Ethical Standards

Informed consent was obtained from the University of North Texas Human Subjects Internal Review Board and from all participants in the study. A licensed professional psychologist was present at both the pilot test and the first workshop for the treatment group in order to ensure observance of the recommendations provided by the authors and reviewers of the original Into Aging game. However, based on the participants' reactions at both events, the concerns that prompted the need for the presence of the licensed psychologist were revisited. It was determined that having a licensed psychologist present for the treatment group during the game debrief was no longer an ethical stipulation.

Treatment

The treatment for this study was a modified version of the Into Aging simulation game (Dempsey-Lyle & Hoffman, 1991). The game is used in gerontological education to generate greater empathy and insight among the participants for the problems encountered in later adulthood. Into Aging presents a “microcosmic experience intended to dramatize certain attitudes and beliefs underlying society’s way of dealing with the elderly” (Dempsey-Lyle & Hoffman, 1991, p. vi). According to Dempsey-Lyle & Hoffman (1991), “the ultimate goal is that the participants’ perspectives and orientation toward the elderly will become more positive” (p.vii).

Selection Criteria.

The Into Aging simulation game was selected for this study because of its (a) widespread use; (b) methodologically sound structure; (c) design taxonomy; and (d) internal and external validity. The game is frequently and favorably referenced in

gerontological literature. Into Aging has been played by professional (i.e., nurses, social workers, physicians, pharmacists, ancillary healthcare workers) and nonprofessional (i.e., families, church groups, older adults) groups since its inception in 1978. Into Aging is considered to be the “classic role-playing simulation game for improving attitudes of nurses toward aging” (Morley, 1998, p. 2). It is also described as a “learning tool” (N. Langer, 1995) and a “powerful instrument [that] serves not to teach content in the field of gerontology per se but to sensitize the participant to areas of interest and concern which previously had not been within their focal awareness” (Williams, 1985, p. 13).

Dempsey-Lyle and Hoffman (1991) described Into Aging as a simulation game that

provides an intense look at one’s own behavior and belief system in relation to the elderly. Before playing the game, people often say they respect and value elderly people, yet after playing the game they discover subtle ways in which they still display negative attitudes and behavior toward the elderly. It is the authors’ hope that all that play ‘Into Aging’ will be provoked or stimulated to examine their own aging process more closely, as well as their attitudes and values about old age. (p. vii)

The methodological rigor used in developing the Into Aging game’s structure was an important consideration. According to Williams (1985) Into Aging is a “well researched simulation game. Its authors painstakingly consulted the literature for data, statistics, theories, and other types of materials to aid them in the formulation of the game” (p.13). The structure of the game closely aligns with the phases of the learning experience outlined in Walter and Marks’s (1981) model for experiential learning and change:

1. The game was well planned and researched by its authors.
2. The game instructions include suggestions for introductions to the learning experience and to specific activities throughout the game.
3. The game's introduction ends by overlapping with the beginning of the activity phase.
4. The game includes a debriefing time following the end of play that reviewers rate as a vital part of the exercise.
5. Instructions for summarizing the game following the debriefing period are provided.
6. The game facilitator is required to observe participants throughout the game for feelings and behaviors displayed in response to the conditions of the game. This provision satisfies Walter & Marks's sixth phase of the model – evaluation. (pp. 160-171)

Another consideration for selecting the Into Aging game for use in this study was the close alignment of its design to Steinkeler and Bell's (1979) "experiential taxonomy." Experiential taxonomies are "unified, complete, functional, and can be easily used" (p.

- 2). Three advantages for using an experiential taxonomy include the following:
 1. The experiential taxonomy augments the affective taxonomy, and supplements and strengthens the cognitive taxonomy.
 2. The experiential taxonomy provides a synthesis of the cognitive, affective, and psychomotor dimensions.
 3. The experiential taxonomy works with any learning theory. (pp. 12-18)

In a review of the Into Aging game for inclusion in this study, the strength of the game's internal and external validity was carefully scrutinized. The internal validity of a simulation game involves the meaningfulness of the experience to the participants. The external validity relates to how well the game model matches its real-world counterpart

(Dickinson & Faria, 1997; Peters et al., 1998). Comments from game reviewers (Marte, 1988; Morley, 1998; N. Langer, 1995; Williams, 1985) were influential in the decision to use the game. Marte (1988) reported, for example:

Approximately 275 people have participated in one of 20 separate gaming experiences. Verbal responses and written evaluations support our belief that this simulation game provides a valuable and exciting learning experience. The benefits derived from Into Aging far surpass the limitations. (p. 168)

Game Features and Characteristics

To help the reader fully understand and appreciate the modifications made to Dempsey-Lyle and Hoffman's (1991) Into Aging game for the purpose of this investigation, a brief overview of the features and characteristics of the original game is presented here. A comparison of the original and modified elements is presented in the Modifications section of this chapter.

The game's authors (Dempsey-Lyle & Hoffman, 1991) have recommended that 5 to 15 participants may play Into Aging at one time. The game takes approximately 1.5 hours to play and requires three table operators and one game facilitator. The intent of the game, according to Dempsey-Lyle and Hoffman, is to help participants (a) gain awareness of the challenges of late adulthood, (b) gain empathy and insight into the problems of late adulthood, (c) develop a more positive orientation and view of aging, and (d) develop strategies for change on a personal and societal level that will have a positive impact on aging (p. 6).

The room arrangement for the original Into Aging game (Marte, 1988) involves three tables that represent modes of living for older people. The scale of the modes, as shown in Figure 2, ranges from independent to dependent lifestyles.

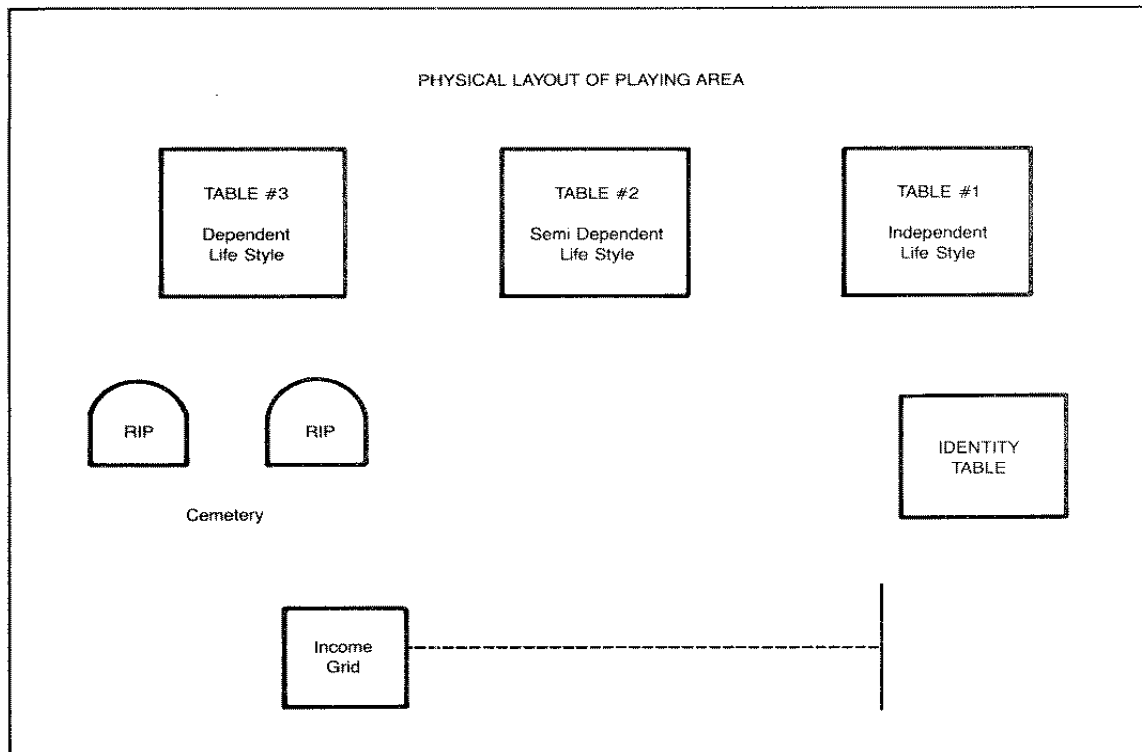


Figure 2. Physical layout of the playing area for Into Aging game (Marte, 1988, p.167).

At the Identity Table, participants invest their personal values in the game. They are asked to select another identity for role-playing purposes. They can model their assumed identity after an older person with whom they are familiar or their own self-image later in life. Each game participant then receives a set of instructions and game materials (i.e., five self-image cards, three pennies as starting income, and a set of five blank cards on which they write their occupation, the type of residence they see themselves having when older, and three favorite possessions with which they wish to

start the game). Before play commences, participants are asked to read the game's instructions. The instructions include the object of the game and the rules they are to follow. According to Marte (1988), "The object of the game is to remain as independent as possible and to retain personal identity despite the odds" (p.166). After the participants share their identities with each other, the game begins, and everyone proceeds to Game Table 1.

Life Event cards are provided at each table. The deck of cards is stacked with odds against the participants, forcing them into a dependent lifestyle. For example, participants must perform a difficult exercise to obtain an income, signifying the financial problems common among older people. The result is that participants experience the loss of favorite possessions and self-image and become increasingly dependent, isolated, and powerless.

After approximately 25 to 30 minutes of play, the facilitator concludes the game. By this time, most participants are at Table 3, with a few at Table 2 or in the Cemetery. Participants discuss their experiences and feelings during a debriefing period. This debriefing period following the game is considered to be the most essential part of the game as a learning tool (Dempsey-Lyle & Hoffman, 1991; Morley, 1998; N. Langer, 1995; Williams, 1985). During the debriefing period, past participants have at times expressed strong and sometimes angry feelings about what they have experienced. Resentment over losses is a major issue, particularly when participants still felt capable of decision-making and self-control. After the debriefing, participants engage in a brief exercise of rewriting the game event cards, followed by a facilitated discussion about how to alter their perceptions and gain insight about aging.

Modifications

Clearly, the original version of Into Aging was not appropriate for use with the target population sampled in this study. To have used the Into Aging game without modification would have seriously threatened the internal validity of the research design.

As Locke, (1986) stipulates:

Simulators that are used for training are based upon a conceptual model that states that a training environment must be designed which permits transfer or generalizability of performance from the lab or training environment to the work environment. (p. 84)

Therefore, it was necessary to modify certain game elements without compromising the integrity of the game's structure and format. For example, the age range for assumed identities, Life Event Cards, the tables, consequence cards, cemetery, and income grid were modified. Prior to inclusion in the study, the modifications outlined in Table 2 and Figure 3 were empirically validated using a Delphi Study (see Appendix B).

Once all of the materials required for the modified game and data-collection workshop were designed and developed, game facilitators were solicited and trained on the conduct of the game, and appropriately sized facilities were reserved. A pilot test was conducted on a sample of subjects representative of the study's applicant pool.

Table 2

Modifications Made to Into Aging 's Reference System and Game Elements for This Study

Original element	Modified element	Premise
Identity Table (age 65+ years)	Identity Table (age 50-62 years)	Workers who are most likely to be targets of ageism are between the ages of 50 and 62*.
Scale: Degree of Independence in Lifestyle	Scale: Value [of employee] to the Company	Older workers are more concerned with maintaining or increasing their value to the company than maintaining or increasing their income level.
Table 1 Independent	Table 1 In Demand (High Value)	
Table 2 Semi-Dependent	Table 2 Borderline (i.e., subject to lay-offs, early retirement options)	
Table 3 Dependent	Table 3 Obsolete (Low Value)	
Cemetery	Unemployment	Workers between 50 and 62 are not as concerned about dying as they are being terminated before they are ready to retire.

(table continues)

Original element	Modified element	Premise
Income Grid	Training Opportunities Grid	Training maintains or increases an older worker's value to the company by preventing obsolescence.
Masking Tape Labels	Visor Labels	Based on the pilot test, participants were more comfortable wearing a visor with a masking tape label than having it applied to their forehead.
Consequence Cards** (related to Life Event issues)	Consequence Cards (related to Workplace Event issues)	To control for threats to the internal validity of the game.
Life Event cards	Workplace Event cards (based on workplace issues validated by the Delphi Study)	To control for threats to the internal validity of the game.

* According to the Equal Opportunity Commission (EEOC), the average age of workers filing charges of age discrimination is 53 years (Deets, 1999, May-June).

** As an older person enters a dependent lifestyle, a cycle of redundancy of repetitive events begins to occur. The consequence cards serve to enforce the cycle (Dempsey-Lyle & Hoffman, 1991).

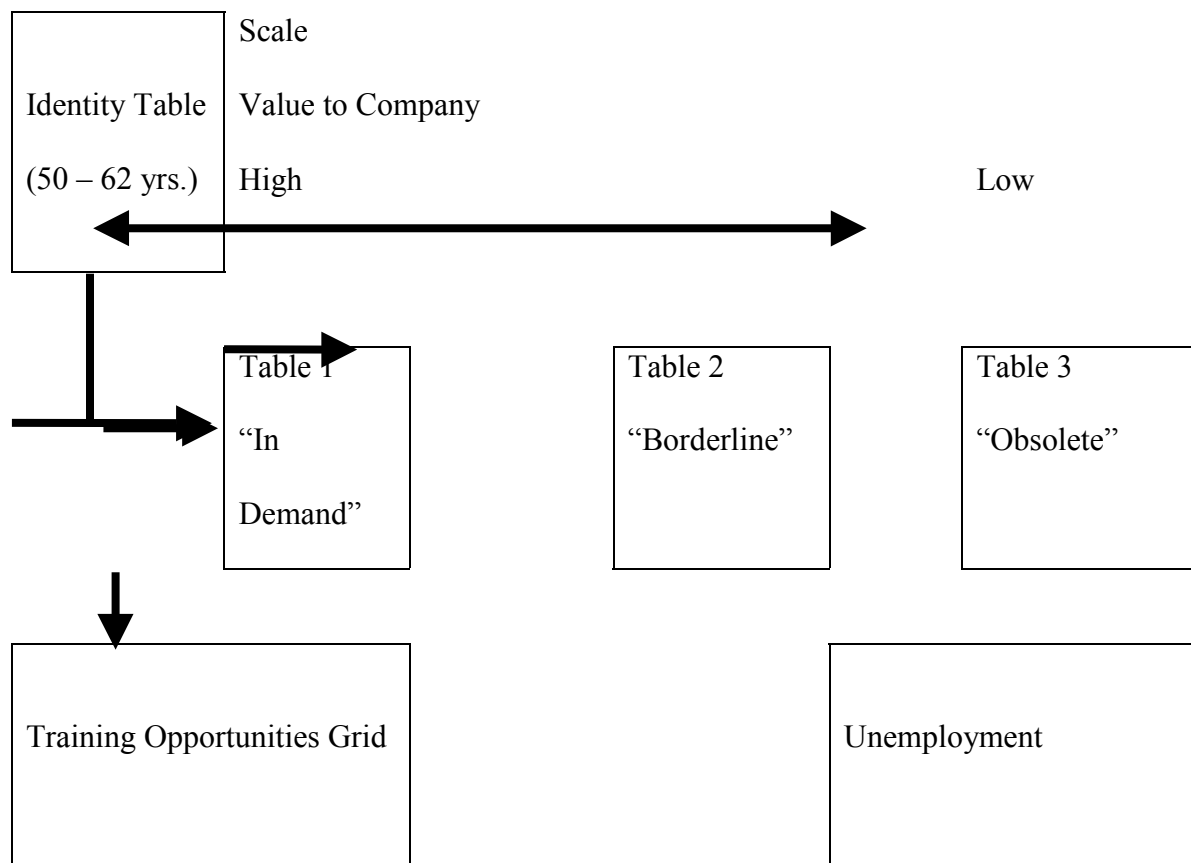


Figure 3. Modified physical layout of the Into Aging game.

Validation Process

The Walter and Marks (1981) experiential learning model served as the guide for modifying the Into Aging game. In contrast to the Pfeiffer model (Pfeiffer & Balleg, 1988b, 1988c, Pfeiffer, 1995), the Walter and Marks model emphasizes specific measures that prevent threats to validity when designing simulation games.

The first step in the validation process was to determine those elements of the Into Aging game’s reference system that needed to be modified for the purposes of this study. A reference system is defined as “the problem or situation that is the subject of our research, teaching or policy” (Peters et al., 1998, p. 21). Sterns et al.’s (1994) Workplace

Events Model guided the determination of the issues to be included in the reference system. The Workplace Events Model is based on broad categories of issues in work and aging that include (a) psychological aging, (b) social aging, and (c) biological aging. Within each of the broad categories of aging, consideration is given to human factors (i.e., training, workplace, and job design); updating (i.e., maintaining current skills and remaining a viable job market competitor); and elder- and child-care-giving assistance (Sterns et al., 1994).

The second step in the validation process was to select a group of 10 informed and geographically dispersed “experts” (see Appendix B, Table 1, for a complete description of the participants’ titles and the type of organizations represented). These expert representatives of the “real world” were tasked with validating the most relevant issues culled from the aging workforce literature cited in chapter 2.

The third step in the validation process was to conduct a Delphi Study. The conventional Delphi Method is a “method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem” (Linstone & Turoff, 1975, p. 3). The Delphi Study data were collected over an interval of 4 months beginning in September 1998, and ending in December 1998. Data were collected using an Internet website, email, facsimile machines, and regular mail. Three rounds were conducted during the 4-month interval (see Appendix B for a complete report of the Delphi Study procedure and findings).

Instruments

Based on previous work (Galbraith & Venable, 1985; McTavish, 1982; Sproull, 1988), the Knowledge Accessing Modes Inventory (KAMI) (Rancourt, 1986), the Aging, Learning and Work Quiz (ALWQ) (Galbraith, 1990), and the Age Group Evaluation and Description (AGED) Inventory (Knox, Gekoski, & Kelly, 1995) were selected for use in this study. These instruments were selected because they represent the most appropriate measures available for this type of research. An explanation of the selection criteria, the appropriateness of each measure, measurement characteristics, instrument administration, and scoring procedures follows.

Instrument Selection Criteria

The criteria in the search for appropriate instruments included (a) the environmental setting in which the instruments were validated, (b) the age of the subjects measured, and (c) the psychometrics of the instrument itself. The flexibility of the instruments had to allow for the assessment of perceptions of older adults in the workplace, not “old people” in healthcare or social services settings. The instruments also needed to be adaptable for assessing participants’ perceptions of older adults between the ages of 50 and 62, rather than of those 65 years and older. In addition, the instruments had to meet the psychometric and selection criteria established by recognized authorities in statistical research methods (Campbell & Stanley, 1963; Hinkle, Wiersma & Jurs, 1994; Huck et al., 1974; Kerlinger, 1986; R.E. Kirk, 1995; Sproull, 1988).

Sproull's (1988) recommendations for instrument selection were also considered.

According to Sproull, an acceptable research instrument

1. measures the variables appropriately,
2. is sufficiently valid and reliable,
3. yields the appropriate level of measurement for each variable,
4. requires an appropriate amount of time,
5. [makes it] easy to acquire participants' response,
6. is easy to administer,
7. is easy to interpret, and
8. costs an amount that is within the researcher's budget. (p.176)

The instruments selected for this study met these criteria based on what the instrument developers reported in the literature. McTavish's (1982) survey of 18 of the "more explicit and quantitative measures that are likely to be considered useful in gerontological research" (p.533) was thoroughly reviewed. Of the 18 instruments surveyed by McTavish, only 6 were relevant for measuring the constructs examined in this study: (a) Tuckman and Lorge's Attitudes Toward Old People (1953); (b) Golde-Kogan's Sentence-Completion Assessment (1959); (c) Rosencranz and McNevin's Attitudes Toward the Aged (1969); (d) Youmans' Perceptions of Old Age (1971); (e) Peterson's Across-Age Semantic Differential (1976); and (f) Palmore's Facts on Aging Quiz (1977, 1981).

McTavish's (1982) comments about the number of frequently recurring flaws in the methodological rigor applied in the development of these instruments were duly noted. For example, conceptual domains are not always clearly identified; convenience selections of subjects are typical; and the domains of the possible features of older people from which the measures sample tend to be broad. Some measures "emphasize knowledge/misinformation, others emphasize affective reaction" (p. 535). Another

limitation McTavish emphasized in his survey is the “lacking or piecemeal attention” given to measurement issues such as reliability and validity information and scale norms (p. 537).

The most significant problem with these measures, according to McTavish (1982), is validity.

It is very difficult to judge validity, because it is conceptually unclear what these measures are to identify. About half of the measures have some type of explicit, if not formal, validity assessment. Rarely is it rigorous, and most often, the investigator’s judgment plays a determining role. In terms of usage, about half of the measures have been used with only one sample. Thus, prior to selecting any one of the existing measurement approaches, an investigator should focus on the theoretical reasons for measuring some aspect of perceptions at all. (p. 538)

In his review of 19 measures pertaining to work and retirement, Powers (1982) expressed concerns similar to McTavish’s (1982).

In research on work and retirement, systematic instrument development has been poor. Researchers tend to use single-item indicators, borrowing rather freely from each other and rewording questions to fit their specific needs. In fact, a variation of the same question can be identified in a number of studies, although the item is seldom worded the same. (p. 231)

The primary problem with many of these measures, according to Powers (1982), “is that the comparison of findings is questionable” (p. 232) because of little concern for exact replication. Powers excluded from his criticism those instruments that have been developed for measuring job satisfaction, occupational roles, leadership, and vocational interests because, in these areas, “psychometric testing and replication have received careful attention” (p. 232).

To Powers's (1982) and McTavish's (1982) reviews of gerontological measures, Galbraith and Venable (1985) added the following:

[The instruments] have tended to evaluate the level of information accumulation about socioeconomic statistical facts concerning persons over 65 years of age or otherwise identified as old. They are focused upon a stereotyped and static model of old age rather than directed at the process of aging and the dynamic behavior changes that parallel this process. (p. 146)

Knowledge Accessing Modes Inventory (KAMI)

The Knowledge Accessing Modes Inventory (KAMI) is a well-researched, 20-item, forced-choice, noncognitive assessment (see Appendix D). It is a self-administered, self-scored inventory, developed by Rancourt, for learning and teaching/training style assessment (Rancourt, 1986, 1989; Noble & Rancourt, 1988; Rancourt & Searle, 1990, 1994). The KAMI is based on Royce's Psycho-Epistemic Profile Inventory (Rancourt, 1986), which was developed at the Center for Advanced Study in Theoretical Psychology at the University of Alberta.

Rancourt began research on the KAMI in 1983. Theoretical underpinnings for the KAMI come from the research of Royce (1983) in psychology, Scheffler (1967) in science, Strasser (1963) in philosophy, and Wirsing (1972) in education (Rancourt, 1986, p. 4). The primary assumption in the instrument is that there are "three basic epistemic ways of knowing, and that each represents a valid path to knowledge acquisition" (Rancourt, 1986, p. 4).

Rancourt (1986) defined knowledge as “personalized information” (p. 4) and acquiring knowledge as “apprehending, and understanding input data (information) once it has been filtered by the senses, the mind or subjective experiencing” (p. 4). The three modes of Rancourt’s model are labeled and defined as follows:

1. Noetic - the experiential-subjective mode.
2. Empirical - the concrete-inductive mode.
3. Rational - the theoretical-deductive mode. (p.5)

The KAMI has been field tested on approximately 25,000 subjects in nine countries, including government training officers, trainers in industry, and human resource personnel (training). It has been translated into five languages other than English. The KAMI is a culturally sensitive inventory with an administration and scoring time of approximately 25 minutes.

Rancourt’s (1986) model was selected because of several distinct psychometric advantages over other learning style measurement instruments, including Kolb’s Learning Style Inventory (LSI) (Cornwell & Manfredro, 1994; Hicks, 1970; Highhouse & Doverspike, 1987; Marshal & Merritt, 1985; Merritt & Marshall, 1984; Pigg, Busch, & Lacy, 1980; Ruble & Stout, 1990; Sims, Veres, Watson, & Buckner, 1986; Tenopyr, 1988); the Gregorc Style Delineator (O’Brien, 1990); and 4MAT System’s Learning Type Measure (LTM) (McCarthy, 1981, 1987).

As a 20-item forced-choice instrument, the KAMI has shown test-retest reliability (Spearman r) of 0.87 for the metaphorical [Noetic] scale, 0.71 for the empirical scale, and 0.81 for the rationale scale. These three scales for the KAMI yield a degree of association that is significant (chi square), at the .001 level, with the three corresponding scales of the Psycho-Epistemic Profile Inventory and thus ensure the necessary construct

validity. “Internal consistency, as expressed by split-half reliability coefficients (Pearson r) has been reported as 0.82 for the metaphorical (M) [Noetic] scale, .78 for the empirical (E) scale, and .79 for the rational (R) scale” (Noble & Rancourt, 1988, p.598).

The primary psychometric advantage offered by the KAMI is its normative measurement characteristics. According to Kerlinger (1986), the distinction between ipsative and normative measurement “is generally misunderstood in research and measurement” (p. 463). Ipsative measurement, a concept introduced by Cattell (1944), has “built in systematic restraints” (Kerlinger, 1986, p. 463) that invalidate its use for selection purposes. For example, an ipsative scale contains no information concerning the absolute or relative differences among individuals on a variable. Instead, the scale measures only the relative differences or rank ordering of a set of variables for a single person. Therefore, ipsative scales are not appropriate for use with hypotheses or psychometric evaluations involving the comparison of between-individual differences (Cornwell & Manfredo, 1994, p. 319).

According to Hicks (1970), ipsative scores are used legitimately only when making intra-individual comparisons, but normative measures can be used legitimately for making either inter-individual or intra-individual comparisons. This characteristic of normative measures was especially important, given the design and purpose of this study.

Aging, Learning and Work Quiz (ALWQ)

The Aging, Learning and Work Quiz (Galbraith, 1990; Galbraith & Venable, 1985) is a 40-item, true-false, self-assessment inventory developed to measure knowledge of age-related changes in learning and work behavior (see Appendix E). The instrument was selected for this study because it (a) is based on observed and documented learning

and work performance behaviors, rather than socioeconomic statistics about persons 65 years and older who no longer work, and (b) measures the cognitive components associated with perceptions of older workers. As Galbraith (1990) points out, “It is important for professionals who work with adults, in all types of settings, to understand how the process of aging affects the learning capabilities and work performances of adults” (p. 52).

Age-related changes associated with biological and psychological processes affect learning and work performance. By being aware of these changes, instructors, managers, and human resource developers can make learning and work more meaningful and rewarding for aging adults (Galbraith, 1990, pp. 56-57).

Unlike other gerontologically derived measures, the ALWQ was validated using subjects from professional associations representing fields associated with aging learners and workers. The Library and Reference Services Division of the Educational Testing Service described the ALWQ as an appropriate measure for use in “group discussions on aging so that misconceptions can be clarified on the basis of fact, and by professionals who work with aging adults to clarify misconceptions about policies which may affect them” ([On-line], available: <http://ericae.net/tc2/tc017924.htm>).

Galbraith (1990) developed the ALWQ by reviewing more than 200 empirically based gerontological studies, and factor analyzed the major themes addressed by the studies into six categories. The categories that emerged included “(a) biology, (b) psychology, (c) learning, (d) decision-making, (e) work performance, and (f) health” (p. 53-54). The specific categories are not labeled on the inventory itself, but the items that comprise each category are Items 1-4 (biology), Items 5-9 (psychology), Items 10-17

(learning), Items 18-23 (decision-making), Items 24-33 (work performance), and Items 34-40 (health).

Galbraith (1990) selected items for each category using two criteria: “(a) the research study from which the item came had to be empirically based, and (b) the findings from the study had to be consistent with findings from other studies evaluated” (1990, p.54). The ALWQ was then subjected to rigorous standards of item analysis and validation (Galbraith, 1990).

The ALWQ’s reliability was determined using a nonrandom sample of 52 graduate students enrolled in adult and vocational education, gerontology, and human resource management courses. A KAPPA coefficient calculated on the inventory results yielded an index of 0.88 (Galbraith, 1990, p. 54). The corrected index was 0.69, which is an acceptable degree of reliability for a true-false inventory, according to Nunnally (as cited in Galbraith, 1990). The ALWQ takes less than 10 minutes to complete.

The ease of administration, the high reliability index, and the demographic characteristics of the subjects used in the validation study were important considerations when making a determination about the appropriateness of the measure for this study.

Age Group Evaluation and Description (AGED) Inventory

The Age Group Evaluation and Description (AGED) Inventory (Gekoski, Knox, & Kelly, 1991; Knox et al., 1995) is a semantic differential instrument that uses two non-overlapping sets of paired adjectives to assess age stereotypes and attitudes toward age-specified targets (see Appendix F). Using an attitudinal measure that allowed for age-specific targets was important because of Braithwaite, Gibson, and Holman’s (1986) work reviewed in chapter 2. Their research concerned the nature of attitudinal measures

that stereotyped to generalized targets vs. those that stereotyped to specific targets. The authors found that the more generalized the target, the more negative the results. Using an attitudinal measure that stereotyped to generalized targets would have introduced unnecessary bias into the study, and served as one more example of a methodologically flawed design.

In the AGED Inventory, 14 pairs of adjectives comprise an evaluative Scale 1 (Attitude), and 14 pairs of adjectives comprise a descriptive Scale 2 (Stereotype Endorsement). Each scale consists of two factors. Seven items comprise each factor. Scale 1 represents the Goodness, and Positiveness factors. Scale 2 represents the Vitality and Maturity factors (see Appendix 4). The authors' statement (Knox et al., 1995) about how the factors are related was especially relevant to this study:

Although the two evaluative factors of the Inventory are orthogonal, and the two descriptive factors are orthogonal, the four sets of items are not mutually orthogonal. Therefore, the AGED is described most appropriately as being composed of four dimensions rather than factors. (p. 45)

Knox et al., (1995) pointed out that “correlations between the two evaluative dimensions (i.e., Goodness and Positiveness) are substantial whereas those between the descriptive dimensions (i.e., Vitality and Maturity) are quite low” (p. 47). The authors attributed the low correlation between the dimensions on the descriptive scale to a broader “domain of descriptive terms” compared to the more narrow “domain of highly evaluative terms” (p. 47).

The AGED Inventory was developed to address the problems with study replication in gerontological research noted by Powers (as cited in Knox et al., 1995).

The AGED Inventory authors attempted to overcome these and other shortcomings found when using the Rosencranz and McNevin's (1969) Aging Semantic Differential (ASD) in several of their own research studies. Their concerns centered on the uncertainty that the ASD measured what it purported to measure.

According to Knox et al. (1995), the ASD purports to measure "valences of stereotypic attitudes," "stereotypes of the aging individual," and "attitudes toward the aged" (p.33). The implication is that failure to "distinguish attitude from stereotype is not compatible with current thinking in social psychology" (1995, p.33). They also noted that this failure is not surprising, given the "differences among studies in the characteristics of the young people sampled, the characteristics of the measurement instruments used to elicit attitudes and perceptions, and the characteristics of the old people respondents are being asked to assess" (Knox, Gekoski, & Johnson, 1986, p. 309). Another factor that contributes to low instrument reliability in gerontological research noted by Fraboni, Saltstone, and Hughes (1990) is that "with few notable exceptions most scales measuring attitudes toward elderly have constructs representing only the cognitive aspects of attitude" (p. 56).

Knox et al. (1995), further contended that "item overlap" can be problematic because it is an issue not typically addressed "empirically or otherwise" in the development of attitude and stereotype measures used in gerontological research (p. 34). Consequently, it is difficult clearly to ascertain which constructs are being measured. In other words, the overlap between the constructs in the ASD made it difficult for Knox et al. (1995) to replicate the factor structure of the Rosencranz and McNevin (1969) model in their own research.

The difficulty in study replication noted by Knox et al. (1995) increases the difficulty of making comparisons across age targets if “the factor structures of the evaluative items and of the descriptive items [are not] stable across ratings of targets of different ages” (p. 36).

The authors noted,

We believe that the AGED Inventory is an improvement over the ASD. This new instrument should prove useful to those wishing to compare how targets of different ages are viewed, and to those wishing to determine how attitudes toward and/or stereotypes of an age group relate to behavior toward that group. (Knox et al., 1995, p. 50)

The methodological rigor applied to the development of the AGED Inventory was a primary consideration in the selection of the measure for this study. The inventory was developed using data from 1,400 respondents, confirmatory factor analyses, and coefficients of congruence statistical procedures. The resulting four dimensions “were found to be replicable for young, middle-aged, and old targets assessed either between or within subject designs” (Knox et al., 1995, p. 31).

Test-retest reliability of the AGED Inventory was estimated by recalling 80 respondents 6 months after rating their initial age-specified targets. These respondents were asked to rate the same targets again using the AGED Inventory. Reliability coefficients calculated for each dimension are reported by the authors as “Goodness” ($r = 0.72$), “Positiveness” ($r = 0.57$), “Vitality” ($r = 0.75$), and “Maturity” ($r = 0.73$) (Knox et al., 1995). Based on the criteria established by recognized authorities (Crocker & Algina, 1986; Sproull, 1988), the reliability coefficients presented by Knox et al. (1995) typify levels that are acceptable for purposes of this study.

The authors set out to develop an instrument that was (a) short, (b) easy to administer, (c) multidimensional, and (d) flexible with respect to target specification (Knox et al., 1995, p. 31). The AGED Inventory takes approximately 15 minutes to complete. Participants are asked to mark each series of bipolar adjectives at a point along a 7-point scale that, in their opinion, is most characteristic of an average person within a targeted age group specified by the researcher using the inventory.

Based on the empirical rigor applied to the AGED Inventory's development, its flexibility and stability in measuring attitudes and/or stereotypes across age-specific targets, and the ease of administration in a variety of settings, it was determined that the AGED Inventory was the most appropriate affective measure available for this study.

Variables

Independent Variable

“Group” (i.e., treatment and control groups) is the independent variable for this study.

Blocking Variable

Because of the relationship between learning style and experiential learning theory discussed in chapter 2, a control (i.e., randomized blocking variable) for possible adverse effects between the independent and dependent variables was included in the research design. The learning styles, or epistemic orientations (i.e., blocking variable), of all participants in this experiment were measured by the KAMI (Rancourt, 1986).

Learning style was used as the blocking variable in the experimental-control randomized block design. Basically, subjects were identified as possessing three different epistemic orientations, which formed the blocking variable. Subjects were

randomly selected from the blocking variable and randomly assigned to either the experimental or control group condition.

Dependent Variables

The dependent variables were (a) knowledge of age-related changes in learning and work behaviors, as measured by the ALWQ; and (b) attitude toward older workers, as measured by the AGED Inventory.

Statistical Hypotheses

To answer the research questions posed in this study, diversity-awareness training utilizing an experientially based simulation game was hypothesized to (a) increase knowledge of the aging effects on learning and work behaviors of older workers, and (b) promote significant change in attitude toward older workers. The following null hypotheses were tested.

H_{01} : There will be no significant difference in knowledge of aging effects on learning and work behaviors of older workers between participants who are trained using a traditional classroom-style lecture and participants who are trained using an experiential simulation game.

$$H_0 = \mu_e - \mu_c = 0$$

$$H_1 = \mu_e - \mu_c > 0$$

H_{02} : There will be no significant difference in attitude toward older workers between participants who are trained using a traditional classroom-style lecture and participants who are trained using an experiential simulation game.

$$H_0 = \mu_e - \mu_c = 0$$

$$H_2 = \mu_e - \mu_c \neq 0$$

Target Population

The membership lists of the American Society for Training and Development/Dallas Chapter (ASTD) ($n = \sim 900$), the Dallas/Fort Worth area chapters of the Society for Human Resource Management (SHRM) ($N = \sim 1500$), and class rosters of four sections of senior-level undergraduate human resource management courses ($n = \sim 150$) comprised the sampling frame for this study.

Sample Demographics

The sample used in this study consisted of 45 women and 20 men. The age demographics by cohort and student status are shown in Table 3.

Table 3

Sample Demographics by Cohort and Student Status Compared With U.S. Population

	Total			
Age cohort*	Student sample	Practitioner sample	sample (%)**	U.S. pop. (%)
Veterans (1922-43)	3	3	9.0	20.0
<u>52 million people</u>				
Boomers (1943-60)	5	15	31.0	28.0
<u>73.2 million people</u>				
Xers (1960-80)	32	7	60.0	26.0
<u>70.1 million people</u>				
Nexters (1980-2000)	0	0	0.0	26.0
<u>69.7 million</u>				

* As defined by Zemke et al., (2000, p. 3).

** Based on ~ 265 million U.S. births recorded (U.S. National Health Statistics), as cited in Zemke et al., (2000, p. 3).

Practitioners

Twenty-five of the participants were practitioners employed full-time in Human Resource Management and Development positions in companies throughout the Dallas/Fort Worth Metroplex. The practitioner participants ranged in age from 25 to 71 years, with a median age of 44 years. Eight of these participants had at least a high school-level education, while 7 of the participants had completed a college degree, and 10 held advanced degrees. Half reported being employed by companies with 500 or more employees, whereas the other half reported being employed by companies with fewer than 500 employees. Nineteen of the 25 practitioner participants (76%) reported receiving either no diversity training or only on an “as-needed” basis. The mode for the type of diversity training received was “inhouse classroom-style” training. Forty percent of the practitioner participants reported having had an experience within the past year with corporate downsizing or mergers that personally affected them or someone close to them (e.g., a spouse, significant other, or family member).

Students

The 40 senior undergraduate students who were included in the sample ranged in age from 20 to 67 years, with a median age of 25. Thirty-two of the students were part-time students; 8 were full-time students. All of the students were employed in either part-time or full-time job positions. Any students reporting a full-time student status with no employment were removed from the final sample. Twenty-two students reported working for companies with at least 500 employees. Eighteen students reported working with companies of fewer than 500 employees. Over half of the students (57.5%) reported having received either no diversity training or on an “as-needed” basis. The mode for the

type of diversity training received was “in-house classroom-style” training. Thirty percent of the student participants reported having had an experience within the past year with corporate downsizing/mergers or an illness/disability that personally affected them or someone close to them (i.e., a spouse, significant other, or family member).

Procedure

Today, workers over 50 are the fastest growing “protected class” of the American workforce (Walsh, 1995), and issues pertaining to older workers are usually included in diversity awareness training topics. Data for this study were collected from an applicant pool of participants voluntarily enrolled in a Diversity Awareness Workshop held at university-affiliated facilities on two separate occasions. All materials used to promote the Diversity Awareness Workshop clearly stated that the workshop was being offered for research purposes. Participants were offered a summary report of the findings in exchange for their participation in the study. The pool of applicants received 3 hours of training about the effects of aging on learning and work behaviors of older workers. The same instructors presented both workshops. Both instructors were professional presenters with subject matter expertise in disciplines related to the workshop content.

Prior to receiving the training, to control for the effects of learning style on training methodology effectiveness, the participants were blocked, based on their learning-style preference as measured by the KAMI, and randomly assigned to a control group and treatment group. The control group received a traditional classroom-style lecture in a separate room of the same facility in which the treatment group received an experientially-based simulation game. Game participants were debriefed following the game for approximately 45 minutes.

Both groups were given the ALWQ and AGED immediately prior to and following the workshop and were told that they would complete the ALWQ and AGED a third time, approximately 30 to 60 days following the workshop. The ALWQ and AGED were distributed to participants again by mail, email, fax, and in person 60 days after the workshop. Followup activities included mailed and emailed reminders to ensure 100% compliance. Out of the pool of applicants who participated in the workshops, 65 (40 students, 25 practitioners) comprised the final sample, yielding a 90% compliance rate. Table 4 presents the KAMI distribution of participants in control and treatment groups.

Table 4

KAMI Distribution

		Knowledge accessing modes			
		<u>Rational</u>	<u>Empirical</u>	<u>Noetic</u>	<u>Total</u>
Group	Control	7	15	8	30
	Treatment	11	13	11	35
Total		18	28	19	65

Total $n = 65$.

Pilot Study

Prior to conducting the actual study, the modified Into Aging game and the workshop materials were piloted, using senior undergraduate students enrolled in human resource management courses at a state university. The structure and content of both workshops (i.e., lecture and simulation game) were evaluated, and revisions were made to ensure that the subject matter for both the treatment and control workshops was

congruent. The pilot study included an evaluation of the administration and scoring logistics for all three measures used in the study, including the design covariate. The workshop time frames were then modified as needed, based on the results of the pilot study.

Summary

The purpose of this study was to determine the effects of one type of diversity awareness training (i.e., simulation game) on knowledge of, and attitude toward, older workers held by current and future human resource management and development practitioners. Consideration was given to knowledge of the effects of age-related changes on learning and work behaviors, as determined by the ALWQ. Consideration was given to attitudes toward older workers, as determined by the AGED Inventory. The findings are presented in chapter 4.

CHAPTER 4

RESULTS

In this chapter, results of the data analysis are presented according to the purposes described in chapter 1 and the procedures outlined in chapter 3. The purpose of this investigation was to examine the effects of a simulation game on trainee's knowledge and attitudes about the age-related changes in the learning and work behaviors of older workers. It was conducted in response to the need for effective diversity awareness programs to help employers create intergenerational friendly work environments. The research questions answered by this investigation are as follows:

1. Will participants who play the Into Aging simulation game (treatment) score significantly higher on the ALWQ (knowledge measure) than participants who receive the traditional classroom lecture method of instruction?
2. Will participants who play the Into Aging simulation game (treatment) experience a more significant change in attitude as measured by the AGED Inventory (attitude measure) than participants who receive the traditional classroom lecture method of instruction?

Results of all analytic procedures related to the research questions and statistical hypotheses are presented. Both descriptive and inferential statistics were used and include demographic frequencies and ANCOVA with Repeated Measures. The 0.05 level of significance was selected for analysis of data relating to the hypotheses.

ANCOVA was applied to this study to increase the precision of the pretest-posttest research design. In order to more accurately partition the SOS_T variance, it was necessary to control for the effects of the covariate (i.e., pretest).

Repeated measures was added to determine the effects of the variance contributed by the 60-day interval of time between the Post1 and Post 2 assessments on both dependent variables following the treatment. In this study, the Pearson correlation coefficient between each covariate and each dependent variable indicated a linear relationship, and no interaction was determined between the covariate and the treatment (Hinkle et al., 1994). The test statistic for ANCOVA (F) is the ratio of the adjusted between-groups mean square (MS'_B) to the adjusted within-groups mean square (MS'_W), as shown in Equation 1:

$$F = MS'_B / MS'_W \quad (1)$$

(i.e., the differences among adjusted means on Y).

To determine the internal consistency and stability of the measurement instruments applied to the population sampled in this study (Kerlinger, 1986), KR-20 and Cronbach's Alpha estimates were obtained. The results are presented in Appendices E and F, respectively.

The assumptions of normality, homogeneity of variance, homogeneity of error variance, and linearity were tested prior to application of the ANCOVA with repeated measures. Boxplots were used to assess the normality of the distribution of scores. Group means on the dependent variables were tested for statistically significant differences using Student's t -test for independent samples. Equality of variance on the dependent variables was determined using Levene's Test for Equality of Variance. Scatterplots were used to determine linearity. Within and between-group differences on each dependent variable were determined by applying separate univariate Analyses of Variance (ANOVAs) (i.e., one for each dependent variable). To accommodate nuances

specific to SPSS software, the total sum of squares from the covariate (i.e., pretest) ANOVA on each dependent variable was then used in the repeated measures analysis of covariance procedure. The results of these tests are presented in Appendices E and F, respectively.

Research Question #1 - ALWQ

Will participants who play the Into Aging simulation game (treatment) score significantly higher on the ALWQ (knowledge measure) than will participants who receive the traditional classroom lecture method of instruction?

Statistical Hypotheses

$$H_0 = \mu_e - \mu_c = 0$$

$$H_1 = \mu_e - \mu_c > 0$$

Descriptive Statistics

In this study, the average performance (i.e., means) on the ALWQ Pretest, Post 1 and Post 2 were examined. The ANCOVA procedure was applied to adjust the raw means for pretest differences. The raw means, standard deviations, sample size, and adjusted means are presented in Table 5.

Table 5

Scores for Control and Treatment Groups by Assessment

	<u>Control</u>				<u>Treatment</u>			
	<u>Mean</u>	<u>Std. dev.</u>	<u>n</u>	<u>Adj. mean</u>	<u>Mean</u>	<u>Std. dev.</u>	<u>n</u>	<u>Adj. mean</u>
ALWQ Pretest	69.57	8.23	30		71.51	7.37	35	
ALWQ Post 1	80.17	12.08	30	80.84 ^a	68.03	8.18	35	67.46 ^a
ALWQ Post 2	75.90	9.35	30	76.47 ^a	69.57	9.79	35	69.08 ^a

^aEvaluated as covariate appeared in the model: ALWQ Pre-test = 70.62.

Inferential Statistics

The results of the ANCOVA with Repeated Measures are shown in Table 6.

Table 6

ANCOVA With Repeated Measures General Linear Model – ALWQ

<u>Source</u>	<u>Sum of</u>		<u>Mean</u>					<u>Observed</u>
	<u>squares</u>	<u>df</u>	<u>square</u>	<u>F</u>	<u>Sig.</u>	<u>Eta²</u>	<u>power</u>	
Covariate	2675.98	1	2675.98	22.34	.00	.265	1.00	
Group	3430.47	1	3430.47	28.64	.00	.316	1.00	
Change	9.98	1	9.98	.28	.60	.005	.08	
Change * Covariate	16.17	1	16.17	.46	.50	.007	.10	
Change * Group	285.11	1	285.11	8.08	.01	.115	.80	
Error	2187.10	59	75.12					
Individual (SS _I)	286.33*							
Total	8891.14	64						

*SS_{res}=SS_T – SS_I - SS_O; p < 0.05.

ALWQ Post 1 effect size. The effect size shown in Equation 2 ($\Delta = 1.08$) is considered “large” according to Cohen’s effect size conventions (Cohen, 1977). Immediately following the treatment, the control group outperformed the treatment groups on the ALWQ Post 1 test by one standard deviation.

$$\Delta = \frac{\text{Adj. Mean}_{\text{treat}} - \text{Adj. Mean}_{\text{control}}}{\text{SD}_{\text{control}}} = \frac{67.46 - 80.84}{12.09} \quad (2)$$

$$\frac{80.84 - 67.46}{12.09} = \frac{13}{12} = 1.08$$

ALWQ Post 2 effect size. The effect size shown in Equation 3 ($\Delta = .79$) is considered “large” according to Cohen’s effect size conventions (Cohen, 1977). Two months after the treatment, the control group still outperformed the treatment group by over one-half standard deviation.

$$\Delta = \frac{\text{Adj. Mean}_{\text{treat}} - \text{Adj. Mean}_{\text{control}}}{\text{SD}_{\text{control}}} = \frac{69.08 - 76.47}{9.35} \quad (3)$$

$$\frac{76.47 - 69.08}{9.35} = \frac{7.39}{9.35} = .79$$

Based on the results of the Repeated Measures ANCOVA and the large effect sizes realized on both dependent variables (ALWQ Post 1 and ALWQ Post 2), there was a significant difference between group means, but not in the direction of the hypothesis tested. Therefore, the decision was maintained not to reject the null hypothesis ($H_0 = \mu_e - \mu_c = 0$) of no difference between the group means.

The answer to the research question that the ALWQ was used to obtain is that participants who play the Into Aging simulation game (treatment) did not score significantly higher on the ALWQ (knowledge measure) than participants who received the traditional classroom lecture method of instruction. However, the disordinal interaction of the control group's performance on the dependent variable from Post 1 and Post 2 precludes acceptance of the directional alternative hypothesis ($H_A = \mu_e - \mu_c > 0$). Further study is recommended to determine the cause of the disordinal interaction. Suggestions for further research are presented in chapter 5.

Research Question #2 – AGED Inventory

Will participants who play the Into Aging simulation game (treatment) experience a significant change in attitude as measured by the AGED Inventory (attitude measure) whereas participants who receive the traditional classroom lecture method of instruction will not?

Statistical Hypotheses

$$H_0 = \mu_e - \mu_c = 0$$

$$H_2 = \mu_e - \mu_c \neq 0$$

Descriptive Statistics

In this study, the average performance (i.e., means) on the AGED Inventory Pretest, Post 1 and Post 2, were examined. The ANCOVA procedure was applied to adjust the raw means for pretest differences. The raw means, standard deviations, sample size, and adjusted means are presented in Table 7.

Table 7

Scores for Control and Treatment Groups by Assessment

	<u>Control</u>				<u>Treatment</u>			
	<u>Mean</u>	<u>Std. dev.</u>	<u>n</u>	<u>Adj. mean</u>	<u>Mean</u>	<u>Std. dev.</u>	<u>n</u>	<u>Adj. mean</u>
AGED Pretest	54.07	9.54	30		54.14	8.77	35	
AGED Post 1	46.63	8.98	30	46.64 ^a	47.74	9.38	35	47.74 ^a
AGED Post 2	46.33	8.30	30	46.36 ^a	44.43	8.82	35	44.41 ^a

^a Evaluated at covariate appeared in the model: AGED Pre-test = 54.11.

Inferential Statistics

The results of the ANCOVA with Repeated Measures are shown in Table 8.

Table 8

ANCOVA with Repeated Measures General Linear Model – AGED Inventory

	Sum of		Mean				Observed
<u>Source</u>	<u>squares</u>	<u>df</u>	<u>square</u>	<u>F</u>	<u>Sig.</u>	<u>Eta²</u>	<u>power</u>
Covariate	200.12	1	200.12	2.42	.13	.04	.33
Group	5.84	1	5.84	.09	.76	.00	.06
Change	336.82	1	336.82	4.76	.03	.07	.58
Change * Covariate	285.42	1	285.42	4.04	.05	.06	.51
Change * Group	74.61	1	74.61	1.05	.31	.02	.17
Error	4383.51	59	70.70				
Individual (SS _I)	61.22						
Total	5347.54	64					

*SS_{res}=SS_T – SS_I - SS_O; p < 0.05.

AGED Inventory Post 1 effect size. The effect size shown in Equation 5 ($\Delta = .12$) is considered “small” according to Cohen’s effect size conventions (Cohen, 1977).

$$\Delta = \frac{\text{Adj. Mean}_{\text{treat}} - \text{Adj. Mean}_{\text{control}}}{\text{SD}_{\text{control}}} = \frac{47.74 - 46.64}{8.98} \quad (4)$$

$$\frac{47.74 - 46.64}{8.98} = \frac{1.1}{8.98} = .12$$

AGED Inventory Post 2 effect size. The effect size shown in Equation 6 ($\Delta = .23$) is considered “small” according to Cohen’s effect size conventions (Cohen, 1977).

$$\Delta = \frac{\text{Adj. Mean}_{\text{treat}} - \text{Adj. Mean}_{\text{control}}}{\text{SD}_{\text{control}}} = \frac{46.36 - 44.41}{8.30} \quad (5)$$

$$\frac{46.36 - 44.41}{8.30} = \frac{1.95}{8.30} = .23$$

Based on the results of the Repeated Measures ANCOVA and the small effect sizes realized on both dependent variables (AGED Inventory Post 1 and AGED Inventory Post 2), the decision was maintained to accept the null hypothesis ($H_0 = \mu_e - \mu_c = 0$) of no difference between the group means.

The answer to the research question that the AGED Inventory was used to obtain is that participants who play the Into Aging simulation game (treatment) experienced no statistically significant change in attitude, as measured by the AGED Inventory (attitude measure), that differed from participants who received the traditional classroom lecture method of instruction.

Further study is recommended to determine the cause of the significant amount of error variance resulting from measurement using the AGED Inventory with the population sampled in this study. Suggestions for further research are presented in chapter 5.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This chapter describes the conclusions and recommendations based on the findings of two research questions about the effects of an experiential training intervention on knowledge and attitudes about older workers. The purpose of this investigation was to examine the effects of a simulation game on trainee's knowledge and attitudes about the age-related changes in the learning and work behaviors of older workers. It was conducted in response to the need for effective diversity awareness programs to help employers create intergenerational friendly work environments. The research questions answered by this investigation are as follows:

1. Will participants who play the Into Aging simulation game (treatment) score significantly higher on the ALWQ (knowledge measure) than participants who receive the traditional classroom lecture method of instruction?
2. Will participants who play the Into Aging simulation game (treatment) experience a more significant change in attitude as measured by the AGED Inventory (attitude measure) than participants who receive the traditional classroom lecture method of instruction?

Experiential learning theory suggests that the knowledge gained and the attitudes changed would differ significantly between participants in the simulation game and participants who received a traditional lecture format. The selected sample size, design sensitivity, instruments, and statistical analyses were appropriate for answering the questions guiding this investigation. The necessary measures were taken to control for threats to the study's internal validity.

Participants were assessed immediately prior to and following the treatment, followed by a third assessment 60 days later. The final sample represented a compliance-to-completion rate of 90% (i.e., 90% of the participants who were present in the initial workshop completed the study over the 2-month interval).

Conclusions

Three conclusions were drawn from the findings of this study. These conclusions are listed in this section of the chapter. Following each conclusion, possible explanations (including related evidence) for the findings are discussed.

Conclusion 1

Contrary to the performance predicted by experiential learning theory, the treatment group did not score significantly higher on the ALWQ (knowledge) than the control group following treatment. The null hypothesis tested was not rejected. Possible explanations for these findings include the following:

Reactive or interaction effect of testing. According to Sproull (1988), the threat of testing effects to internal validity is a definite weakness in experimental pretest posttest control group designs. Based on the work of Crocker and Algina (1986) the participants' behaviors could be altered by the ALWQ pretest so that their scores on the ALWQ Post 1 assessment "reflect effects of memory, practice, learning, boredom, sensitization, or any other consequence of the first measurement" (p. 134). In this study, the treatment group's scores on the ALWQ Post 1 assessment immediately following the simulation game could also be a reflection of the participants' lack of time to absorb and process into memory the insights gained from their experience. The control group's scores on the ALWQ Post 1 assessment may have been a result of sensitization to the

items on the instrument during the pretest administration prior to the intervention.

Testing effects are examples of the noisy variables that are difficult to control in formal research designs outside of laboratory settings.

Peterson and Peterson's (1959) short-term memory (STM) theory (as cited in S. K. Reed, 1992). "Information in STM is lost rapidly unless it is preserved through rehearsal" (p. 66). In this study, the treatment group did not have time prior to the ALWQ Post 1 assessment to mentally rehearse the information gained through participation in the simulation game. Another possible factor that may have prevented the mental rehearsal that is necessary to retain new information is interference. Waugh and Norman's (1965) work, as cited in S. K. Reed (1992), suggested that "the number of interfering items has a dramatic effect on retention. The probability of recall declines rapidly as the number of interfering items increases" (p. 69). According to the authors, "Items that are likely to interfere with each other should be studied at different times rather than during a single session" (p. 72). Given that a premise of experiential learning theory is participant exposure to a lot of information through active involvement in the learning event, it is reasonable to assume more sources of interfering items are present in a simulation game than are present in a traditional classroom lecture. Treatment group participants in this study might have retained less information, as measured by the ALWQ, because of exposure to a greater number of interfering items operating in a simulation game than the amount of interference control group participants were exposed to in a traditional classroom-style learning event.

Instrument reliability with the population sampled. Because reliability is a property of the scores on a test for a particular group of examinees, “whenever a test user’s sample differs considerably from that reported by a test publisher, empirical investigation of the reliability for the new sample is appropriate” (Crocker & Algina, 1986, p. 143). One of the differences between the target population sampled in this study and the target population used to estimate the reliability of the ALWQ was Galbraith’s (1990) inclusion of students enrolled in gerontology courses. It is not inconceivable that prior knowledge about the effects of age-related changes on general behavior may have favorably biased Galbraith’s validation study on the ALWQ and inflated the reliability estimates reported in the literature. Consequently, when the ALWQ was used in this study to detect differences in a sample of a target population with no prior gerontological knowledge, the instrument could have been less sensitive to differences resulting from the treatment and more sensitive to differences resulting from other factors (Lipsey, 1990).

Failure to control for confounding variables. One example of a confounding variable that may have suppressed the effects of the treatment in this study is personal experience with older adults. According to Knox et al. (1986),

Personal experience with older people should have the greatest influence on one’s pro or con views of older people, but it may be that experiences other than those assessed by the instrument have some influence on more descriptive aspects of one’s views, and even more influence on one’s knowledge of the basic facts about aging. (p. 312)

In another study by Intrieri et al., (1993) reviewed in chapter 2, the authors found that participants developed more positive attitudes and demonstrated more socially skilled behavior during an interview with an older adult. The investigation of the effects

of personal experience with older adults as a variable was beyond the scope of this study. However, additional research pertaining to the effects of personal experience with older adults in workplace settings is warranted. Along with personal experience with older people, other possible confounding variables that merit further investigation are (a) the range of ages of the participants, (b) instructor biases toward participants, (c) variation in instructor delivery, and/or (c) participants' internalized age bias toward the instructors.

Conclusion 2

The expected between-group difference in attitudinal change suggested by prior evidence of diversity awareness training was not detected in the sample investigated in this study. The attitudinal change experienced by the treatment group did not differ significantly from the attitudinal change experienced by the control group, as measured by the AGED Inventory. The null hypothesis tested was not rejected.

Possible explanations center on the characteristics of the measurement instrument used (i.e., the AGED Inventory) rather than the effectiveness of the treatment itself. According to Lipsey (1990), the ideal measure for treatment effects is one that is "(a) maximally responsive to any changes the treatment brings about, and (b) minimally responsive to anything else" (p. 99). However, in the absence of ideal measures, researchers often have no choice but to use those that vary more in response to other factors than to the treatment they are being employed to measure.

For example, the AGED Inventory, like other self-administered attitudinal questionnaires, might have been influenced by "fluctuations in respondents' attention, motivation, comprehension, and so forth" (Lipsey, 1990, p. 101). Outside of laboratory settings, these fluctuations are extremely difficult to prevent. Other possible sources of

variance in a test score indicated by Issac and Michael (1995), include characteristics of the individual that are as follows:

1. Lasting and general (e.g., age bias), including attitudes, emotional reactions or habits generally operating in situations like the test situation.
2. Lasting and specific, including attitudes, emotional reactions, or habits related to particular test stimuli (e.g., age bias toward older workers brought to mind by an inquiry about such bias on an attitude inventory).
3. Temporary and general (systematically affecting performance on various tests at a particular time) including present attitudes, emotional reactions, or strength of habits (insofar as these are departures from the person's average or lasting characteristics – e.g., being involved in a research study at a time when there are more pressing distracters).
4. Temporary and specific, including (a) fluctuations in attention, coordination, or standards of judgement, (b) fluctuations in memory for particular facts, (c) level of practice on skills or knowledge required by this particular test (e.g., effects of no prior gerontologically related knowledge), (d) temporary emotional states and strength of habits related to a particular test stimuli (e.g., a test item calls to mind a recent negative experience), and (e) luck in the selection of answers by “guessing.” (p.133)

Low instrument reliability indices for the constructs being measured due to insufficient research (i.e., gaps in the literature) about the characteristics of the attributes (traits) targeted for investigation in this study. Crocker and Algina (1986) offered this question to consider: When a low correlation coefficient is obtained, does this indicate that the test provides unreliable measures of the trait, or does it imply that the trait itself is unstable? (p. 134). This leads to a second question: Are the definitions of the traits measured by the AGED Inventory clearly operationalized for application within a workplace environment? The possible incongruence of operationalized traits purported

to be measured by the AGED Inventory with variables under investigation may have contributed to the statistical insignificance of the results yielded by this investigation.

As the review of literature in chapter 2 suggested, (i.e., Knox et al. (1986)) the research behind the development of instruments for measuring perceptions and attitudes toward old people has been “large and contradictory with little consensus” (p. 309). The authors cited several reasons: “(a) the differences among studies in the characteristics of the young people sampled, (b) the characteristics of the measurement instruments used to elicit attitudes and perceptions, and (c) characteristics of the old people respondents are being asked to assess.” (Knox et al., 1986, p. 309). Therefore, it is not an unreasonable speculation that instruments designed to measure perceptions and attitudes toward old people, such as the AGED Inventory, are not equally valid and reliable for measuring perceptions and attitudes toward older workers.

Reactive effects of experimental arrangements (Sproull, 1988). The participants might have reacted in some unknown or uncontrolled way to the conditions of the experiment, aside from the Hawthorne effect. For example, Zemke et al. (2000) noted an interaction between age cohort and training methodology. “For some reason, Boomers do not respond well to role-playing, albeit engaging and practical” (p. 243). Rynes and Rosen (1995), in their research to improve the effectiveness of diversity training programs, have found that diversity training outcomes can potentially be neutral or negative. Inherent within experiential learning interventions is the possibility that participants might remain neutral because of the frightening and emotionally demanding nature of changing one’s behavior (Pfieffer & Ballew, 1991; Rynes & Rosen, 1995). Examples of possible negative outcomes include “(a) backlash, (b) reinforcement of

group stereotypes, (c) post-training participant discomfort, group infighting, and even lawsuits based on stereotypes exposed during awareness-raising sessions” (Rynes & Rosen, 1995, p. 248).

Conclusion 3

The proportion of error variance in the AGED Inventory scores yielded by the ANCOVA with repeated measures statistical analysis warrants further investigation. The most feasible explanation for the large proportion of error variance is the measurement reliability of the AGED Inventory as it was applied to this study.

Nunnally (as cited in Loftin & Madison, 1991) suggested that “measurement reliability becomes crucial in employing statistical partialling operations, as in the analysis of covariance or in the use of partial correlation analysis” (p. 145). Furthermore, the increased precision obtained with ANCOVA is related to the size of the correlation between the variable *Y* (i.e., AGED Inventory posttests) and the covariate (i.e., AGED Inventory pretest).

According to Feldt (as cited in Loftin & Madison, 1991), covariance is more precise with correlations greater than 0.6, a condition that does not often occur in educational research. Keppel maintained that with correlations less than 0.2 or 0.3, or with small sample sizes, covariance does not offer much of an advantage over a standard analysis of variance (as cited in Loftin & Madison, 1991). See Appendix F for AGED Inventory Pearson Correlations.

Recommendations

Based on the conclusions of this study, several implications for human resource managers and developers are worth noting. Recommendations for further research pertaining to workplace attitudes and perceptions toward older workers conclude this chapter.

Implications

The implications of this study are meaningful to current and future human resource managers and developers seeking to deploy effective diversity training programs in their organizations.

Human Resource Managers. For Human Resource Managers, the broader implications of this study pertain to the need for additional empirical research noted by Rynes & Rosen (1995):

Human resource managers are hampered by the almost complete absence of empirical research showing that diversity, per se, represents an actual or potential competitive advantage in organizations. To date, much of the pro-diversity literature has a strong ‘trust me’ flavor to it. The general point is that human resource managers would have a far easier time ‘selling’ diversity or making diversity training successful if a stronger research base linking workforce heterogeneity to various interventions and outcomes supported them. (p. 267)

More studies need to be conducted to evaluate the long-term effects of diversity awareness interventions pertaining to ageism in the workforce (Rynes & Rosen, 1994). To this suggestion, the findings of this study add that further research is needed using more accurate measurement tools which have yet to be developed.

Furthermore, duration of intervention studies need to be conducted in order to determine the effects of length and frequency of exposure to diversity awareness interventions designed to redress ageism in the workforce. For example, the study by Carmel et al. (1992) referred to in chapter 1 investigated the short term effects of interventions in educational gerontology settings aimed at changing knowledge and attitudes.

The authors found the following:

Because attitudes are deeply rooted in cognitive entities, there is reason to believe that short-term achieved changes can diminish over a longer period of time, or alternatively, that null short-term effects on attitudes can become positive in the long-run after students have time to better absorb the new information. (p. 331)

If the treatment in this investigation had been longer in duration and administered more than once, the effects of the treatment might have been substantially different. Participants might have had more time and opportunity to absorb and implement new information. Statistically significant differences between the control and treatment groups might have been detected by the instruments used.

Human Resource Developers. The findings of this study align with the suggestion offered by Sackett and Mullen (1993) that human resource developers, in their efforts to design, deliver, and evaluate diversity interventions aimed at redressing ageism in the workforce, should weigh their determination to measure change or measure level of achievement against externally imposed expectations. Externally imposed expectations such as the projected utilitarian value of a training program over multiple repetitions (i.e., return on investment) should be weighed against the expected measure of change in individual trainees' performances.

By applying formal experimental designs, such as those used in this investigation, human resource developers are attempting to answer the question; Can the degree of change attributable to training be quantified? (Sackett & Mullen, 1993). However, as Sackett and Mullen (1993) have suggested, human resource developers may want to revisit the heavy emphasis that textbook treatments of training evaluation place on “design issues as the mechanism for controlling threats to validity given the realities of the training world” (p. 620). The researchers (Sackett & Mullen, 1993) call for the consideration of methods other than formal design for validating inferences that training has produced a change of a given magnitude:

For example, history effects as an alternative explanation for change can be examined through direct inquiry, via the interview or questionnaire, as to whether trainees have undergone other experiences concurrently with the training program which could affect posttest measures. Maturation effects may be ruled out on logical grounds in many cases simply due to the short time duration of the training program. Instrumentation is typically not an issue when measurement of training outcomes is standardized. Access to performance ratings, selection test scores, and other file data may provide insight into the risk of statistical regression or selection as plausible threats to validity, as they may offer insight into the atypicality of a group receiving training or into similarity between training and control groups not created randomly. (p. 621)

In spite of the rigorous design and similarity of elements to the realities of the training world employed in this investigation, changes in participants’ knowledge and attitudes about older workers (as measured by the instruments used) could not be directly attributed to the effects of the specific training intervention evaluated. However, if other methods had been used in addition to the formal design employed (i.e., follow-up interviews, performance observations, in-basket assessment exercises, etc.), the change

that occurred, as indicated by the anecdotal data collected through participant evaluations, might have been statistically quantifiable.

Contributions to the field

This study offers a number of contributions to the HRMD field generally, and specifically to the body of knowledge concerning the design of diversity awareness interventions aimed at redressing workplace ageism. In general, HRMD research should be designed to minimize testing effects. By supplementing pretest-posttest designs with other data collection methods, researchers can reduce the variable noise generated by testing effects and enhance the sensitivity of their designs to detect significant treatment effects.

Reliable instruments need to be developed that are maximally responsive to treatment effects and minimally responsive to confounding variables in the study of workplace ageism. Currently, these instruments do not exist and benchmarking measures from other disciplines, such as those used in educational gerontology, may not yield significant results that can be generalized to workplace settings.

Furthermore, the findings of this study provide additional evidence that mental rehearsal is necessary for retaining information in short term memory. HRMD practitioners need to allow time for program participants to mentally rehearse insights gained prior to assessing program effectiveness.

Regarding the design of effective diversity awareness interventions, a factor that reduces retention is interference. “Data dumps” of information do not reduce interference. Therefore, HRMD practitioners should design programs to minimize

interference by presenting information in well-organized and clearly-defined sub-topics with opportunity for review prior to introducing new information.

Based on the findings of this study, if diversity awareness programs aimed at redressing workplace ageism yield statistically insignificant or negative results, HRMD practitioners should conduct further investigations to determine the factors that contributed to the undesirable results before discounting the value of the intervention. There are key reasons why this is particularly important for programs designed to redress workplace ageism.

Although aging is the universal leveler, and no living being is exempt from eventually experiencing the effects of aging – in the workplace or any other environment -- people differ in their attitudes and beliefs about aging, and how it affects them personally. As Allport (1958) believed, attitudes differ from beliefs, and beliefs can be altered without changing attitudes. But if beliefs accommodate negative attitudes, they are harder to change. Intervention effectiveness may be less a product of program design and more a direct reflection of the difficulty incurred when changing mindsets influenced by strong negative beliefs and attitudes.

Another possibility to consider is the universal realization that there are no fountains of youth. This realization brings each person closer to the reality of his or her own inevitable mortality, and frequently generates anxiety among those involved with training programs about aging, as evidenced by Butler's (1987) premise that anxiety about aging leads to the avoidance of the reality of aging.

Consequently, HRMD practitioners should anticipate and proactively design for the probability of reactive effects influencing the results of diversity awareness programs

that address workplace ageism. For example, they might consider using a research design that controls for the effects of anxiety about aging.

They should also anticipate and proactively plan for addressing probable reactive effects from decision-makers prior to the design and implementation of such programs. For example, little is known about the effects of cultural differences in decision-makers' beliefs about aging, or how these differences might contribute to or mitigate reactive effects among those responsible for authorizing programs about aging.

As with all effective diversity training programs, those which are designed to heighten awareness about the age-related changes in learning and work behaviors of older workers should include carefully planned initial marketing efforts and effective program follow-up measures.

Suggestions for Further Study

Suggestion 1. The disordinal interactive effect of the control group's performance on the ALWQ during the 60-day interval between post-assessments warrants further investigation. Although the control group outperformed the treatment group by one standard deviation, why did the control group's adjusted average performance on the ALWQ Post 2 assessment negatively differ from their average performance on the ALWQ Post 1 assessment? Was this disordinal interaction a predictable outcome based on Specht and Sandlin's (1991) work reviewed in chapter 2? Their study examined the effects of an experiential learning exercise used in an undergraduate accounting class and compared the results to those attained when the traditional lecture method was used in another class.

Results revealed no significant differences in short-term learning between the two classes; however, the experiential class experienced no significant differences in quiz scores over time, while there was a significant decrease in the scores of the lecture class over a six-week period. These findings indicate the key difference in the two learning methods is the students' retention of the concepts over time. (p. 196)

Or, was the disordinal interaction a result of some other confounding variable pertaining specifically to workplace ageism that warrants further exploration?

Suggestion 2. The statistically significant change in attitude, as measured by the AGED Inventory, that occurred within each group during the 60-day interval following treatment warrants further investigation. Was this change due to treatment effects or due to heightened awareness effects that the AGED Inventory was not designed to detect? If so, what are the variables associated with heightened awareness, and how can they be effectively measured in future studies of workplace ageism?

Suggestion 3. In the applied disciplines of human resource management and development (HRMD), equal attention should be paid to outcomes determined by qualitative research (i.e., identifying the factors that make up the constructs to be measured) so that more reliable instruments can be developed. For example, the following questions should be explored: (a) Is there a correlation between personal experience and one's attitudes and perceptions of older workers? and (b) Is there a correlation between beliefs about older people and beliefs about ethnic minority groups, as noted by Kidwell and Booth (1977); Kogan and Shelton (1962); and Levin and Levin (1980) that can be validly generalized to workplace environments? (as cited in Knox et al., 1986, p. 309).

Another possibility for exploratory research is cohort bias. For example, what are the age-related factors that interact, regardless of learning style preference, with participants' response to method of training delivery, as suggested by Zemke et al. (2000)? Furthermore, How do the possible interactions impact diversity awareness interventions aimed at redressing workplace ageism?

Suggestion 4. Based on the outcomes of this study, HRMD practitioners should incorporate a variety of strategies in their evaluations, and not depend entirely on the rigor of formal experimental designs to minimize threats to internal validity. As reviewed in chapter 2, Green's (1981) study suggested that when a variety of methods are used in research about attitudes and perceptions about older people, a greater variance in perceptions is usually found. Green (1981) also suggested that other recent work has yielded interactions of sex, race, and various aspects of appearance with age and these interactions influence perceptions.

Subsequent studies to this investigation might employ post-intervention interviews with participants to determine if they had other experiences concurrent with the diversity workshop that might have affected their responses to post-intervention assessments (Sackett & Mullen, 1993). How might the nature and duration of these experiences have confounded the variables being measured?

Suggestion 5. HRMD students might want to consider conducting duration-of-intervention studies to determine training program "shelf-life," vs. relying totally on experimental designs that do little to control for the noisy variables that are common to educational research of this nature (i.e., comparing training methodologies using control group designs).

An example of an alternative analysis that students should consider when conducting research to improve the measurement models that determine training program effectiveness is latent trait analysis and structural equation modeling (Schumacker & Lomax, 1996).

According to Jöreskog and Sörbom (1993),

Measurement models are important in the social and behavioral sciences when one tries to measure such abstractions as people's behavior, attitudes, feelings and motivations. Most measures employed for such purposes contain sizeable measurement errors and the measurement models allow us to take these errors into account. (p. 16)

Another approach that could be used to investigate the external and internal validity of treatment participation is random strategy criterion approach proposed by Dickinson and Faria (1997). "This approach offers a more logical conceptual foundation than past research approaches" (p. 263). With the random strategy criterion, the authors introduce an original criterion for the validity of simulation participation that is "akin to the random sampling error basis of statistical hypothesis testing – specifically, whether the results of participants presumably acting on logical, analytical, thoughtful bases are significantly better than results obtainable on a random decision-making basis" (p. 263).

Summary

The purpose of the study was to examine the effects of a simulation game on trainee's knowledge and attitudes about the age-related changes in the learning and work behaviors of older workers. This investigation was conducted in response to prior evidence that suggested a need for effective diversity awareness programs to help employers create intergenerational friendly work environments. In the absence of programs designed specifically for implementation in workplace settings, efforts made to

benchmark interventions that are used successfully in educational gerontology yielded marginal results. The findings of this study are congruent with prior evidence (e.g., Carmel et al., 1992; Intrieri et al., 1993) suggesting that "[gerontological education] programs developed simply to increase knowledge of normal aging with the hope of improving attitudes toward the old have had limited success" (p. 374). The results of evaluations of the effectiveness of such programs on changes in knowledge and attitudes have been inconsistent. The diversity of findings reported in the literature has been attributed to the different teaching methods and measures used in teaching gerontology. Elements of this attribute appeared in this investigation, as well. However, what this study contributes to the body of knowledge that prior studies have not is a substantiated plea for further research about workplace ageism. Too little is presently known about the variables that should be measured, and even less is known about the constructs from which measurement instruments should be developed. The challenge for 21st century HRMD practitioners and researchers is enormous:

The graying of America seems statistically inevitable, and this reality will affect the economy and the workforce in numerous ways. The ways that business adjusts to this change will have enormous impact on all our futures. Once the problem is clear, the solution becomes clear: Making changes that will convince older Americans to participate longer in the workforce. Doing that, however, will require developing a deep understanding of the forces that have been pushing people out of the workforce – the disillusion created by downsizing and displacement, the push toward retirement as a way of life that began in the 1950s and peaked in the 1970s, and the attitudes toward older workers that discourage continued effort, and even participation. With that understanding, and a study of successful efforts already under way in some corporations, we can begin to shape a new social contract that will encourage people once again to consider large corporations good places to work. (Goldberg, 2000, p. 11)

APPENDIX A
HUMAN SUBJECTS IRB APPROVAL LETTER



University of North Texas
Sponsored Projects Administration

September 8, 1998

Suzanne Dunn
P.O. Box 305913
Denton, TX 76203

Re: Human Subjects Application No. 98-158

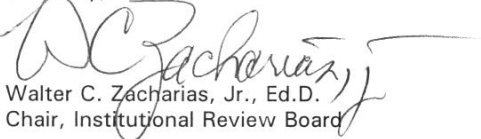
Dear Ms. Dunn:

As permitted by federal law and regulations governing the use of human subjects in research projects (45 CFR 46), I have conducted an expedited review of your proposed project titled "Effects of a Simulation Game On Corporate Trainers' Knowledge About Aging and Counterproductive Attitudes Toward Older Workers." The risks inherent in this research are minimal, and the potential benefits to the subjects outweigh those risks. The submitted protocol and informed consent form is hereby approved for use of human subjects on this project.

The UNT IRB must re-review this project prior to any modifications you make in the approved project. Please contact me if you wish to make such changes or need additional information.

If you have any questions, please contact me.

Sincerely,


Walter C. Zacharias, Jr., Ed.D.
Chair, Institutional Review Board

WZ:sb

cc: IRB Members

P.O. Box 305250 • Denton, Texas 76203-5250
(940) 565-3940 • Fax (940) 565-4277 • TDD (800) 735-2989
e-mail: lane@abn.unt.edu

APPENDIX B
PARTICIPANT DATA FORM

Name:	Age:	Sex: <input type="checkbox"/> Female <input type="checkbox"/> Male
Education Level Achieved: <input type="checkbox"/> HS Diploma <input type="checkbox"/> Associates Degree <input type="checkbox"/> Bachelors <input type="checkbox"/> Masters <input type="checkbox"/> Doctorate (Ph.D. or Ed.D.)		
Employer: 	Time in Position: yrs. mos.	
Primary Responsibilities:	<input type="checkbox"/> Full time <input type="checkbox"/> Part time	
Industry of Employer Organization:		
Size of Employer Organization: <input type="checkbox"/> Less than 500 employees <input type="checkbox"/> 500 to 2500 employees <input type="checkbox"/> More than 2500 employees Size of Employer Organization's Training Department: <input type="checkbox"/> 1 to 10 employees <input type="checkbox"/> 11 to 25 employees <input type="checkbox"/> More than 25 employees		
Frequency of Formal Diversity Training You Receive from your Employer: <input type="checkbox"/> Monthly <input type="checkbox"/> Quarterly <input type="checkbox"/> Semi-Annually <input type="checkbox"/> Annually <input type="checkbox"/> As Needed <input type="checkbox"/> None <input type="checkbox"/> Other: <i>(please describe)</i>	Type of Formal Diversity Training You Receive from your Employer: <i>(check all that apply)</i> <input type="checkbox"/> In-house classroom style workshop <input type="checkbox"/> Outside vendor provided seminar <input type="checkbox"/> Self-study materials <input type="checkbox"/> Other: <i>(please describe)</i>	
Have you had an experience within the last year with any of these issues that may have affected a spouse, significant other, family member, or you personally? <i>(Please check all that apply).</i> <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Layoffs due to Downsizing / Mergers <input type="checkbox"/> Lateral Transfers / Demotions </div> <div> <input type="checkbox"/> Constructive Dismissal / Termination <input type="checkbox"/> Illness or Disability </div> </div> <p>Please describe how the event(s) checked above affected you (i.e., personally, professionally, and/or emotionally). Use the back if more space is needed.</p>		
Please sign and date the following statement and complete the section below.		

I, _____ have read and fully understand

(please print your name)

that “*Age Discrimination in the Workplace: A Diversity Awareness Workshop*” is a **RESEARCH PROJECT**, and that my participation in the **FREE** workshop is voluntary. I understand that for research purposes only, I may be asked to complete confidential questionnaires prior to and following the workshop, and provide information to the researcher about my participation.

Your Signature

Date

.....
(Please Print)

Mailing Address:.....

City: _____ State: _____ Zip:...

Email Address: _____ Daytime Phone:

☐ Please send me a complimentary *Summary of Findings Report* about this research study.

APPENDIX C
DELPHI STUDY SUMMARY REPORT

Delphi Study – Aging Workforce Issues

Summary Report

Purpose of the Study

The purpose of this study was to validate selected findings in the research literature pertaining to workplace issues affecting older workers. The method used was the Delphi Method; a "method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem" (Linstone & Turoff, 1975, p.3).

OBJECTIVE

The primary objective of this Delphi Study was to produce a listing of the most relevant and salient issues affecting older employees (between the ages of 50 and 62) in today's workplace. The results of this study will be used in dissertation research on the effects of a simulation game training intervention on knowledge about aging and counterproductive attitudes toward older workers.

Data Collection

Timeline

Data for the Delphi Study was collected for four months beginning in September, 1998, and ending December 21, 1998.

Media

Data was collected using an Internet website, email, facsimile machines, and regular mail.

Participants

Ten participants were geographically dispersed within the domestic United States. A description of their titles and the type of organizations is shown in Table 1.

Table 1

Delphi Study experts by title and type of organization

Title	Type of Organization
Research Design Facilitator	Major insurance company headquartered in Hartford, Connecticut
Director, Employee Development	Telecommunications company headquartered in the D/FW metroplex
Plant Manager	Oil-industry equipment and tools manufacturer headquartered in the D/FW metroplex
Managing Director and President	Data/information service division of an international consulting firm headquartered in Bethesda, Maryland
Executive Vice President	Office of Workforce and Economic Development in a Community College located in Cleveland, Ohio
President	Executive secretarial school located in the D/FW metroplex
Vice President of Gerontology	Financial services division of a major insurance company headquartered in Hartford, Connecticut
Program Director	Retired and Senior Volunteer Program (RSVP) located at a community college in Waco, Texas
Corporate gerontologist	Financial services division of a major insurance company headquartered in Hartford, Connecticut
President and CEO	Executive development consulting firm located in the D/FW metroplex

Rounds

Three rounds were conducted during the four-month data collection period.

Round One: Participants were asked to generate a list of 10 to 15 issues that affect older employees (ages 50-62) in today's workplace. The results were then edited into a manageable summary of items arranged randomly on a second questionnaire.

Round Two: Using a five-point Likert scale, participants were asked to rate the probability (or likelihood) that each of the resulting issues would occur and affect older workers in today's workplace.

Round Three: Participants were presented with the results of Questionnaire Two in the form of Questionnaire Three, showing the group mean rating for each item from Round Two, and requesting that participants review the mean ratings prior to rating each item a second time. If participants' second rating differed from the mean rating for each item, they were instructed to provide a brief explanation explaining the difference.

Results

Rounds One and Two of questioning yielded a list of 45 key aging workforce issues. Each issue was rated on a 5-point Likert scale.

1	2	3	4	5
Does not occur		Occurs sometimes		Occurs frequently

The rated issues from Round Two are listed below:

There are two underlined numbers in front of each item. The first number indicates the rating assigned to that item by the majority of the participants. (Note: A display of two numbers, stacked vertically, indicates a tie between two ratings, each receiving the same percentage of votes by participants). The second number indicates the percentage of participants who constituted the majority for that item. Comments provided by participants on Round Three are italicized following the issue statement to which they pertain.

<u>3</u>	<u>50</u>	1. Older workers have difficulty accepting or adapting to new business practices.	
<u>3</u>	<u>70</u>	2. In a high tech environment, older workers are trained on the job which reduces transfer and retention.	
<u>3</u>	<u>60</u>	3. Older workers are viewed as leaders because of their high level of experience.	“
		<i>Technological expertise is causing “old” experience to be valued less.”</i>	
<u>2</u>	<u>50</u>	4. The number of job-related injuries are high among older workers.	“
		<i>.... depends on the occupation.”</i>	
		<i>...in selected industries.”</i>	“
<u>5</u>	<u>50</u>	5. Older workers are concerned about their retirement savings and financial security in retirement.	
<u>3</u>	<u>50</u>	6. A changing work environment leads to feelings of inadequacy among older workers.	“
		<i>...[due to] technological impact.”</i>	
<u>3</u>	<u>50</u>	7. Older workers are less interested in being "re-educated" at this stage in their career.	
<u>3</u>	<u>80</u>	8. Older workers have no desire to retire and work as if there were "no tomorrow."	“
		<i>Yes...when they enjoy their jobs or have more limited outside interests...”</i>	
<u>3</u>	<u>50</u>	9. Older workers are more complacent and willing to be followers instead of leaders.	“
		<i>My experience indicates that the older people get the more easily they tire and don't</i>	
		<i>.....f</i>	

		<i>eel the need to lead."</i>
<u>3</u>	<u>90</u>	10. "Short timers" syndrome (until retirement) is common among older workers.
<u>4</u>	<u>50</u>	11. The lack of experience with computer technology is a concern for older workers.
<u>3</u>	<u>30</u>	12. Physical requirements of some positions (i.e., heavy lifting, sitting too long in one spot) are obstacles for older workers.
<u>4</u>		
<u>3</u>	<u>40</u>	13. Older workers are less willing to change work habits to meet emerging business issues.
<u>3</u>	<u>40</u>	14. Older workers are reluctant to shift from a hierarchical management structure to horizontal (i.e., collaborative) management structure.
	 " <i>...it happens on occasion with this group as it does with every other work group."</i>
<u>3</u>	<u>40</u>	15. Older workers are less comfortable and less self-confident in learning settings in which younger employees are present.
<u>1</u>	<u>40</u>	16. Personnel allowances are made for "old age" absences.
<u>2</u>		
<u>2</u>	<u>70</u>	17. Balancing work load with stamina is a challenge for older workers.
<u>3</u>	<u>40</u>	18. Older workers contend with ageist stereotypical images which are not based on facts or even gross productivity measures.
	 " <i>....the stereotypes are in place due to the humor in publications (i.e., birthday cards, tc..) due to the premium values we place on youth and being young."</i>
<u>4</u>	<u>30</u>	19. "One size fits all" training methodologies are used with older workers.
	 " <i>I see this happening occasionally with all workers – regardless of age."</i>
	 " <i>This fits all populations including older workers."</i>
<u>4</u>	<u>30</u>	20. The most common unit benefit formulas in Defined Benefit Pensions use several recent salary year averages which lock older workers into career peak jobs.
<u>1</u>	<u>40</u>	21. Training during work hours is not "acceptable" for many older workers in higher level jobs.
	 " <i>Higher level corporate older workers are often leading organizations where their own self-development is last on the list so I see them using after hours and weekends s. normal work hours."</i>
<u>3</u>	<u>50</u>	22. Training programs that combine older higher level employees with lower level younger employees are difficult for older employees.
<u>2</u>	<u>40</u>	23. Research and information on older workers lumps every one into one large group.

4	<u>50</u>	24. Older employees can be misled by the attractiveness of "Golden Handshakes" if they are not financially prepared and educated in retirement planning. " ...this occurs sometimes because there has not been as much education available for p eople at middle and lower income levels."
4	<u>50</u>	25. Older workers wanting to leave the workforce early do not have affordable medical benefits available.
4	<u>70</u>	26. Benefit packages are not always designed for the needs of 50-62 year olds. Flex time, eldercare, retirement planning are not available enough.
5	<u>40</u>	27. Tax deferred retirement plans for small businesses are much less available and have lower contribution limits (i.e. older workers in small businesses are at a disadvantage).
4	<u>50</u>	28. Companies lack information on the differences between the retraining and post-retirement needs of low skilled older workers vs. highly skilled older workers. " This is rarely addressed."
5	<u>60</u>	29. Age is a diversity issue.
4	<u>40</u>	30. Work environments do not accommodate the ergonomic needs of older workers (i.e., lighting, print size, seating, etc...). " This is increasing."
4	<u>50</u>	31. The issue of higher pay due to longer tenures, and higher benefit costs due to employee age and health hurts older workers' opportunities for promotion and advancement. " Doesn't happen often."
<u>3</u> <u>4</u>	<u>40</u>	32. Older workers have limited job mobility.
4	<u>40</u>	33. Older workers have fewer opportunities for retraining based on costs and years of return on training dollars spent. " Concern is for present...long-term return is <u>now</u> only 1 to 2 years out."
2	<u>70</u>	34. Older workers are away from the office frequently in order to perform caregiver responsibilities for parents and relatives in 70-90 year old range. " Due to larger family networks."
2	<u>50</u>	35. Older workers often need additional part-time work to be able to financially support and provide for children or grandchildren.
2	<u>50</u>	36. Older workers require more employer flexibility due to increased health problems that need to be checked on more routinely.

	 “ Depends on the person and how well they take care of themselves or lost the O ppportunity to do so.”
<u>2</u>	<u>70</u>	37. Older workers lack the stamina required to perform some routine tasks.
<u>3</u>	<u>60</u>	38. Older workers are often asked to take on more responsibilities because they are perceived as dependable, conscientious, and generally have good customer service skills. “ From personal experience, most [older workers] do have better customer service S kills, and are more dependable and conscientious than the average person.”
<u>2</u>	<u>60</u>	39. Older workers often have to work two jobs in order to increase their retirement benefits. “ I believe this occurs mostly due to unanticipated events.”
<u>2</u> <u>3</u>	<u>40</u>	40. Death or illness of a spouse or family member is a frequent occurrence among older workers. “ Family networks are older and larger...it is bound to be more frequent.”
<u>3</u> <u>4</u>	<u>50</u>	41. Older workers are considered over qualified for many job positions.
<u>2</u>	<u>40</u>	42. Older workers are not inclined to drive and work after dark. “ Happens often in my workplace (community college).”
<u>2</u>	<u>50</u>	43. Work and family demands restrict an older employee's time for developing the skills and knowledge necessary to maintain employability.
<u>5</u>	<u>30</u>	44. Government funded job training programs have income guidelines that exclude many older workers.
<u>3</u> <u>4</u>	<u>40</u>	45. When an older worker becomes "plateaued," and other work opportunities and challenges are not available, boredom and resignation can lead to decreased productivity and reduced self-esteem. “ This is not exclusive to older workers...could happen in any age-group.”

The rated issues from Round Three are listed below:

1	2	3	4	5
Does not occur		Occurs sometimes		Occurs frequently

There are two underlined numbers in front of each item. The first number indicates the rating assigned to that item by the majority of the participants. The second number indicates the percentage of participants who constituted the majority for that item.

3	70	1. Older workers have difficulty accepting or adapting to new business practices.
3	90	2. In a high tech environment, older workers are trained on the job which reduces transfer and retention.
3	60	3. Older workers are viewed as leaders because of their high level of experience.
2	80	4. The number of job-related injuries are high among older workers.
5	70	5. Older workers are concerned about their retirement savings and financial security in retirement.
3	90	6. A changing work environment leads to feelings of inadequacy among older workers.
3	80	7. Older workers are less interested in being "re-educated" at this stage in their career.
3	60	8. Older workers have no desire to retire and work as if there were "no tomorrow."
3	80	9. Older workers are more complacent and willing to be followers instead of leaders.
3	70	10. "Short timers" syndrome (until retirement) is common among older workers.
4	70	11. The lack of experience with computer technology is a concern for older workers.
3	90	12. Physical requirements of some positions (i.e., heavy lifting, sitting too long in one spot) are obstacles for older workers.
3	80	13. Older workers are less willing to change work habits to meet emerging business issues.
3	60	14. Older workers are reluctant to shift from a hierarchical management structure to horizontal (i.e., collaborative) management structure.
3	90	15. Older workers are less comfortable and less self-confident in learning settings in which younger employees are present.
2	40	16. Personnel allowances are made for "old age" absences.

1	40	
2	90	17. Balancing work load with stamina is a challenge for older workers.
3	40	18. Older workers contend with ageist stereotypical images which are not based on
3	40	facts or even gross productivity measures.
4	70	19. "One size fits all" training methodologies are used with older workers.
4	60	20. The most common unit benefit formulas in Defined Benefit Pensions use several
		recent salary year averages which lock older workers into career peak jobs.
1	40	21. Training during work hours is not "acceptable" for many older workers in higher
5	40	level jobs.
3	70	22. Training programs that combine older higher level employees with lower level
		younger employees are difficult for older employees.
2	60	23. Research and information on older workers lumps every one into one large group.
4	60	24. Older employees can be misled by the attractiveness of "Golden Handshakes" if
		they are not financially prepared and educated in retirement planning.
4	80	25. Older workers wanting to leave the workforce early do not have affordable medical
		benefits available.
4	100	26. Benefit packages are not always designed for the needs of 50-62 year olds. Flex
		time, eldercare, retirement planning are not available enough.
5	70	27. Tax deferred retirement plans for small businesses are much less available and have
		lower contribution limits (i.e. older workers in small businesses are at a
		disadvantage).
4	70	28. Companies lack information on the differences between the retraining and post-
		retirement needs of low skilled older workers vs. highly skilled older workers.
5	50	29. Age is a diversity issue.
4	60	30. Work environments do not accommodate the ergonomic needs of older workers
		(i.e., lighting, print size, seating, etc...).
4	50	31. The issue of higher pay due to longer tenures, and higher benefit costs due to
		employee age and health hurts older workers' opportunities for promotion and
		advancement.
4	50	32. Older workers have limited job mobility.

4	60	33. Older workers have fewer opportunities for retraining based on costs and years of return on training dollars spent.
2	80	34. Older workers are away from the office frequently in order to perform caregiver responsibilities for parents and relatives in 70-90 year old range.
2	90	35. Older workers often need additional part-time work to be able to financially support and provide for children or grandchildren.
2	70	36. Older workers require more employer flexibility due to increased health problems that need to be checked on more routinely.
2	90	37. Older workers lack the stamina required to perform some routine tasks.
3	80	38. Older workers are often asked to take on more responsibilities because they are perceived as dependable, conscientious, and generally have good customer service skills.
2	80	39. Older workers often have to work two jobs in order to increase their retirement benefits.
2	80	40. Death or illness of a spouse or family member is a frequent occurrence among older workers.
3	50	41. Older workers are considered over qualified for many job positions.
4	50	
2	90	42. Older workers are not inclined to drive and work after dark.
2	70	43. Work and family demands restrict an older employee's time for developing the skills and knowledge necessary to maintain employability.
5	50	44. Government funded job training programs have income guidelines that exclude many older workers.
3	70	45. When an older worker becomes "plateaued," and other work opportunities and challenges are not available, boredom and resignation can lead to decreased productivity and reduced self-esteem.

The resulting salient issues with ratings of “3” and above are listed below in rank order of importance according to the mean score (first column) derived from the third round of questioning. Column two preceding each issue statement displays the percentage of participants assigning the rating shown.

		1 Does not occur	2	3 Occurs sometimes	4	5 Occurs frequently
	(%)					
4	100	1. Benefit packages are not always designed for the needs of 50-62 year olds. Flex time, eldercare, retirement planning are not available enough.				
3	90	2. Physical requirements of some positions (i.e., heavy lifting, sitting too long in one spot) are obstacles for older workers.				
3	90	3. Older workers are less comfortable and less self-confident in learning settings in which younger employees are present.				
3	90	4. In a high tech environment, older workers are trained on the job which reduces transfer and retention.				
3	90	5. A changing work environment leads to feelings of inadequacy among older workers.				
4	80	6. Older workers wanting to leave the workforce early do not have affordable medical benefits available.				
3	80	7. Older workers are often asked to take on more responsibilities because they are perceived as dependable, conscientious, and generally have good customer service skills.				
3	80	8. Older workers are more complacent and willing to be followers instead of leaders.				
3	80	9. Older workers are less willing to change work habits to meet emerging business issues.				
3	80	10. Older workers are less interested in being "re-educated" at this stage in their career.				
5	70	11. Tax deferred retirement plans for small businesses are much less available and have lower contribution limits (i.e. older workers in small businesses are at a disadvantage).				
5	70	12. Older workers are concerned about their retirement savings and financial security in retirement.				
4	70	13. The lack of experience with computer technology is a concern for older workers.				

4	70	14. Companies lack information on the differences between the retraining and post-retirement needs of low skilled older workers vs. highly skilled older workers.
4	70	15. "One size fits all" training methodologies are used with older workers.
3	70	16. When an older worker becomes "plateaued," and other work opportunities and challenges are not available, boredom and resignation can lead to decreased productivity and reduced self-esteem.
3	70	17. Training programs that combine older higher level employees with lower level younger employees are difficult for older employees.
3	70	18. Older workers have difficulty accepting or adapting to new business practices.
3	70	19. "Short timers" syndrome (until retirement) is common among older workers.
4	60	20. Work environments do not accommodate the ergonomic needs of older workers (i.e., lighting, print size, seating, etc...).
4	60	21. The most common unit benefit formulas in Defined Benefit Pensions use several recent salary year averages which lock older workers into career peak jobs.
4	60	22. Older workers have fewer opportunities for retraining based on costs and years of return on training dollars spent.
4	60	23. Older employees can be misled by the attractiveness of "Golden Handshakes" if they are not financially prepared and educated in retirement planning.
3	60	24. Older workers have no desire to retire and work as if there were "no tomorrow."
3	60	25. Older workers are viewed as leaders because of their high level of experience.
3	60	26. Older workers are reluctant to shift from a hierarchical management structure to horizontal (i.e., collaborative) management structure.
5	50	27. Government funded job training programs have income guidelines that exclude many older workers.
5	50	28. Age is a diversity issue.
4	50	29. The issue of higher pay due to longer tenures, and higher benefit costs due to employee age and health hurts older workers' opportunities for promotion and advancement.
4	50	30. Older workers have limited job mobility.

3	50	31. Older workers are considered over qualified for many job positions.
4	50	
3	40	32. Older workers contend with ageist stereotypical images which are not based on facts or even gross productivity measures.
3	40	
1	40	33. Training during work hours is not "acceptable" for many older workers in higher level jobs.
5	40	

List of aging workforce issues with ratings of 2 or less, excluded from the final list:

	1 Does not occur	2	3 Occurs sometimes	4	5 Occurs frequently
1.	The number of job-related injuries are high among older workers.				
2.	Personnel allowances are made for “old age” absences.				
3.	Balancing work load with stamina is a challenge for older workers.				
4.	Research and information on older workers lumps every one into one large group.				
5.	Older workers are away from the office frequently in order to perform caregiver responsibilities for parents and relatives in 70-90 year old range.				
6.	Older workers often need additional part-time work to be able to financially support and provide for children or grandchildren.				
7.	Older workers require more employer flexibility due to increased health problems that need to be checked on more routinely.				
8.	Older workers lack the stamina required to perform some routine tasks.				
9.	Older workers often have to work two jobs in order to increase their retirement benefits.				
10.	Death or illness of a spouse or family member is a frequent occurrence among older workers.				
11.	Older workers are not inclined to drive and work after dark.				
12.	Work and family demands restrict an older employee's time for developing the skills and knowledge necessary to maintain employability.				

Resources

- Barber, Clifton E. (1992). Developing gerontological education/training programs for business and industry: What are the most salient aging workforce issues to address? Poster session presented at the annual meeting of the Association of Gerontology in Higher Education, Baltimore, Maryland, February 28, 1992.
- Barber, Clifton E. (1992, July/August). Delphi method can help companies forecast aging-workforce issues. Aging Today, pp. 13-14.
- Issac, S. & Michael, W.B. (1995). Handbook in research and evaluation: A collection of principles, methods, and strategies useful in the planning, design, and evaluation of studies in education and the behavioral sciences (3rd ed.). San Diego, California: Educational and Industrial Testing Service.
- Linstone, H.A. & Turoff, M. (1975). Introduction. In H.A. Linstone & M. Turoff (Eds.), The Delphi method: Techniques and applications (pp. 3-12). Reading, Massachusetts: Addison-Wesley Publishing Company.
- Peters, V., Vissers, G, & Heijne, G. (1998). The validity of games. Simulation & Gaming, 29 (1), pp. 20-30.
- Pfeiffer, J.W. & Ballew, A.C. (1988a). Using structured experiences in human resource development (UATT Series, Vol. 1). San Diego, CA: University Associates.
- Pfeiffer, J.W., and Ballew, A.C. (1988b). Using Role Plays in Human Resource Development (UATT Series, Vol. 4). San Diego, CA: University Associates.
- Pfeiffer, J.W. & Ballew, A.C. (1988c). Using case studies, simulations and games in human resource development (UATT Series, Vol. 5). San Diego, CA: University Associates.
- Rosenbaum, J. (1991). The pedagogic Delphi: A pilot application in an introductory global studies course. Paper presented at the East-West Center Institute of Culture and Communication Summer Workshop for the Development of Intercultural Coursework at Colleges and Universities, Honolulu, Hawaii, July 23, 1991. [On-line]. Available: <http://www.ithaca.edu/rhp/tvr/tvr1/papers/delphi.htm>
- Sterns, H.L., Barrett, G.V., Czaja, S.J., & Barr, J.K. (1994). Issues in work and aging. The Journal of Applied Gerontology, 13(1), pp. 7-19.

APPENDIX D

KAMI



*Consulting, Training & Publishing
Consultation, formation et édition*

*Multimedia ... with Style !
Multimédia ... avec style !*

Thursday June 18, 1998

Mrs. Suzanne Dunn
5904 New Haven
Plano, Texas
75093

Subject: Knowledge Accessing Modes Inventory

Dear Suzanne,

As discussed I am sending you the information I believe will be of great value for your research project proposal.

At IMPACT, we are very much "Research Oriented" and wish to help serious researchers around the world. Should you decide to use the KAMI, I will offer you KAMI questionnaires at a substantially low cost provided you would grant IMPACT to use your research results as part of our database and library.

Here's what Dr. Patricia Pitcher says about KAMI...

"The knowledge Accessing Modes Inventory (KAMI) published by IMPACT is a great tool that I'm using in my consultations with clients. I recommend it without any doubt!", Dr. Patricia Pitcher, Author of: The drama of leadership, John Wiley and Sons, New York 1994.

Should you need more information, do not hesitate to communicate with me at 613.746.4100.

Regards,


Guy L. Levert
President & CEO

1173 Cyrville Road, Suite 210, Ontario, Canada, K1J 7S6
1173 chemin Cyrville, pièce 210, Gloucester (Ontario) Canada, K1J 7S6
Tel. : (613) 746-4100 / Fax : (613) 746-4106 / INTERNET : www.impacttraining.com

Figure 1. KAMI Permission Letter

KNOWLEDGE ACCESSING MODES INVENTORY (KAMI)



Instructions: On this K.A.M.I. response sheet, you are to describe the way you see yourself most of the time and in most situations. For each question, three statements are offered. The statement that comes closest to describing you is rated [1], your first choice in other words. Of the remaining two statements, the one that comes closest to describing you is rated [2], your second choice. And of the three statements, the one that is the least descriptive of you is rated [3], your third choice.

Remember, the inventory is neither a personality test nor a test of mental abilities. There are no right or wrong answers.

Example:

The most important factor for successful learning is:

- | | |
|-----|--------------------------|
| [1] | a) good teaching |
| [2] | b) appropriate materials |
| [3] | c) motivation |

<p>1. I enjoy reading about subjects that are:</p> <p><input type="checkbox"/> a) practical in nature</p> <p><input type="checkbox"/> b) artistic or biographical</p> <p><input type="checkbox"/> c) theoretical or scientific</p>	<p>11. I learn best when I am encouraged to:</p> <p><input type="checkbox"/> a) touch and manipulate things</p> <p><input type="checkbox"/> b) think about new ideas</p> <p><input type="checkbox"/> c) express my personal feelings</p>
<p>2. I prefer to be with people who are:</p> <p><input type="checkbox"/> a) spontaneous</p> <p><input type="checkbox"/> b) trustworthy</p> <p><input type="checkbox"/> c) realistic</p>	<p>12. A good friend is one who:</p> <p><input type="checkbox"/> a) is down-to-earth and practical</p> <p><input type="checkbox"/> b) lives by a set of principles</p> <p><input type="checkbox"/> c) shares personal experiences</p>
<p>3. A good teacher helps me to:</p> <p><input type="checkbox"/> a) improve my thinking skills</p> <p><input type="checkbox"/> b) become more self-confident</p> <p><input type="checkbox"/> c) learn useful and practical skills</p>	<p>13. When visiting a new area, I like to:</p> <p><input type="checkbox"/> a) see as much as possible</p> <p><input type="checkbox"/> b) meet and make new friends</p> <p><input type="checkbox"/> c) plan my activities beforehand</p>
<p>4. I accept advice when it appeals to my:</p> <p><input type="checkbox"/> a) logic</p> <p><input type="checkbox"/> b) feelings</p> <p><input type="checkbox"/> c) common sense</p>	<p>14. School should help us to:</p> <p><input type="checkbox"/> a) think and reason critically</p> <p><input type="checkbox"/> b) know ourselves better as persons</p> <p><input type="checkbox"/> c) learn technical and useful skills</p>
<p>5. When playing a game or a sport, I:</p> <p><input type="checkbox"/> a) do what feels right</p> <p><input type="checkbox"/> b) focus on strategy</p> <p><input type="checkbox"/> c) demonstrate flexibility</p>	<p>15. When I buy clothes, I want them to be:</p> <p><input type="checkbox"/> a) an expression of my personality</p> <p><input type="checkbox"/> b) well tailored and designed</p> <p><input type="checkbox"/> c) practical and comfortable</p>
<p>6. In a dangerous situation:</p> <p><input type="checkbox"/> a) imagine an escape</p> <p><input type="checkbox"/> b) observe the situation</p> <p><input type="checkbox"/> c) react spontaneously</p>	<p>16. I admire a teacher who is:</p> <p><input type="checkbox"/> a) down-to-earth and helpful</p> <p><input type="checkbox"/> b) creative and dynamic</p> <p><input type="checkbox"/> c) competent in subject matter</p>
<p>7. A job should offer the occasion for:</p> <p><input type="checkbox"/> a) personal growth</p> <p><input type="checkbox"/> b) an intellectual challenge</p> <p><input type="checkbox"/> c) varied experimentation</p>	<p>17. My opinions are most often based on:</p> <p><input type="checkbox"/> a) facts or observations</p> <p><input type="checkbox"/> b) principles or logic</p> <p><input type="checkbox"/> c) hunches or feelings</p>
<p>8. I would feel hurt if someone accused me of:</p> <p><input type="checkbox"/> a) being biased in my observation</p> <p><input type="checkbox"/> b) reacting before thinking</p> <p><input type="checkbox"/> c) not having any principles</p>	<p>18. I understand things because I use:</p> <p><input type="checkbox"/> a) my intuition</p> <p><input type="checkbox"/> b) my thinking</p> <p><input type="checkbox"/> c) common sense</p>
<p>9. I appreciate a teacher that:</p> <p><input type="checkbox"/> a) lets me discover and try things</p> <p><input type="checkbox"/> b) presents a well structured course</p> <p><input type="checkbox"/> c) is caring and enthusiastic</p>	<p>19. Friends would describe me as being too:</p> <p><input type="checkbox"/> a) sensitive</p> <p><input type="checkbox"/> b) practical</p> <p><input type="checkbox"/> c) logical</p>
<p>10. I like to believe that I am:</p> <p><input type="checkbox"/> a) intuitive and spontaneous</p> <p><input type="checkbox"/> b) practical and realistic</p> <p><input type="checkbox"/> c) logical and analytical</p>	<p>20. If I am involved in a competition, I:</p> <p><input type="checkbox"/> a) adjust to situations as they arise</p> <p><input type="checkbox"/> b) participate instinctively</p> <p><input type="checkbox"/> c) follow a predetermined plan</p>

Figure 2. Knowledge Accessing Modes Inventory

Instructions to Participants

On the K.A.M.I. response sheet, you are to describe the way you see yourself most of the time and in most situations. For each question, three statements are offered. The statement that comes closest to describing you is rated “1”, your first choice in other words. Of the remaining two statements, the one that comes closest to describing you is rated “2”, your second choice. And of the three statements, the one that is the least descriptive of you is rated “3”, your third choice.

Remember, the inventory is neither a personality test nor a test of mental abilities. There are no right or wrong answers.

Example:

The most important factor for successful learning is:

- “1” a. good teaching
- “3” b. appropriate materials
- “2” c. motivation

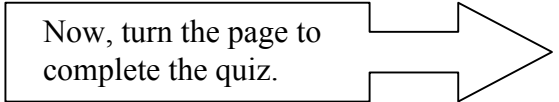
APPENDIX E

ALWQ

INSTRUCTIONS

This quiz takes less than 10 minutes to complete. It is important to remember when responding to the question that this quiz does not focus upon any specific age range of adults; instead, it focuses on adults as they age.

Please circle “T” for true or “F” for false to indicate your opinion about each statement.



Now, turn the page to
complete the quiz.

Please circle “T” for true or “F” for false to indicate your opinion about each statement.

- | | | | |
|---|---|-----|---|
| T | F | 1) | Vision tends to decline with age. |
| T | F | 2) | Hearing tends to decrease with age. |
| T | F | 3) | Ability to adapt to external temperature change tends to decline with age. |
| T | F | 4) | Time required to react to a stimulus tends to rise with age. |
| T | F | 5) | Anxiety tends to decrease with age. |
| T | F | 6) | Cautiousness tends to rise with age. |
| T | F | 7) | Performance after reprimand tends to rise with age. |
| T | F | 8) | Risk taking tends to increase with age. |
| T | F | 9) | Self-concept tends to rise and then decline with age. |
| T | F | 10) | Pace of learning tends to decline with age. |
| T | F | 11) | The need to relate new information to current knowledge tends to decrease with age. |
| T | F | 12) | Ability to learn complex material tends to increase with age. |
| T | F | 13) | Abstract reasoning tends to rise with age. |
| T | F | 14) | Short-term memory tends to rise with age. |
| T | F | 15) | Accumulation of knowledge tends to decline with age. |
| T | F | 16) | The learning process tends to change with age. |
| T | F | 17) | Ability to learn tends to remain stable with age. |
| T | F | 18) | Data collection for decision-making tends to decline with age. |
| T | F | 19) | Information overload tends to decline with age. |
| T | F | 20) | Time required to make a decision tends to increase with age. |
| T | F | 21) | Conservativeness in decision making tends to decline with age. |
| T | F | 22) | Review of previously successful solutions for problem solving tends to increase with age. |
| T | F | 23) | Importance of experience in decision making tends to decline with age. |
| T | F | 24) | Accuracy of work tends to decrease with age. |
| T | F | 25) | Rate of worker output tends to decrease with age. |
| T | F | 26) | Consistency of worker output tends to decline with age. |
| T | F | 27) | Timed performance tends to decline with age. |
| T | F | 28) | Untimed performance tends to remain stable with age. |
| T | F | 29) | Individual differences in performance tend to decrease with age. |
| T | F | 30) | Job turnover tends to decrease with age. |
| T | F | 31) | Worker absenteeism tends to rise with age. |
| T | F | 32) | Work satisfaction tends to remain stable with age. |
| T | F | 33) | Work performance tends to remain stable with age. |
| T | F | 34) | Chronic health conditions tend to decrease with age. |
| T | F | 35) | Short-term health conditions tend to increase with age. |
| T | F | 36) | Recovery time from health conditions and injuries tends to rise with age. |
| T | F | 37) | Severity of work injury tends to decrease with age. |

- T F 38) Frequency of work injury tends to rise with age.
T F 39) Risk of work injury tends to decrease with age.
T F 40) Total costs of work injury tend to decline with age.



Disclaimer Note

The version of the quiz portion of ALWQ that was used in the study fit onto one page.

ALWQ Scoring Key

- | | | |
|---|-----|---|
| T | 1) | Vision tends to decline with age. |
| T | 2) | Hearing tends to decrease with age. |
| T | 3) | Ability to adapt to external temperature change tends to decline with age. |
| T | 4) | Time required to react to a stimulus tends to rise with age. |
| F | 5) | Anxiety tends to decrease with age. |
| T | 6) | Cautiousness tends to rise with age. |
| F | 7) | Performance after reprimand tends to rise with age. |
| F | 8) | Risk taking tends to increase with age. |
| T | 9) | Self-concept tends to rise and then decline with age. |
| T | 10) | Pace of learning tends to decline with age. |
| F | 11) | The need to relate new information to current knowledge tends to decrease with age. |
| F | 12) | Ability to learn complex material tends to increase with age. |
| F | 13) | Abstract reasoning tends to rise with age. |
| F | 14) | Short-term memory tends to rise with age. |
| F | 15) | Accumulation of knowledge tends to decline with age. |
| T | 16) | The learning process tends to change with age. |
| T | 17) | Ability to learn tends to remain stable with age. |
| F | 18) | Data collection for decision-making tends to decline with age. |
| F | 19) | Information overload tends to decline with age. |
| T | 20) | Time required to make a decision tends to increase with age. |
| F | 21) | Conservativeness in decision making tends to decline with age. |
| T | 22) | Review of previously successful solutions for problem solving tends to increase with age. |
| F | 23) | Importance of experience in decision making tends to decline with age. |
| F | 24) | Accuracy of work tends to decrease with age. |
| T | 25) | Rate of worker output tends to decrease with age. |
| F | 26) | Consistency of worker output tends to decline with age. |
| T | 27) | Timed performance tends to decline with age. |
| T | 28) | Untimed performance tends to remain stable with age. |
| F | 29) | Individual differences in performance tend to decrease with age. |
| T | 30) | Job turnover tends to decrease with age. |
| F | 31) | Worker absenteeism tends to rise with age. |
| T | 32) | Work satisfaction tends to remain stable with age. |
| T | 33) | Work performance tends to remain stable with age. |
| F | 34) | Chronic health conditions tend to decrease with age. |
| F | 35) | Short-term health conditions tend to increase with age. |
| T | 36) | Recovery time from health conditions and injuries tends to rise with age. |
| F | 37) | Severity of work injury tends to decrease with age. |
| F | 38) | Frequency of work injury tends to rise with age. |

- T 39) Risk of work injury tends to decrease with age.
T 40) Total costs of work injury tend to decline with age.

Statistics

Reliability

Kuder-Richardson 20

The Kuder-Richardson 20 procedure was applied to scores from the ALWQ, a binary-choice measurement instrument, because they are dichotomous (Crocker & Algina, 1986; Issac & Michael, 1995; Popham, 1990). The KR-20 is a formula “which rests on the notion that if a test’s items are relatively homogeneous, there will be lots of variance on the test because, for example, on a knowledge test, examinees who know the subject well will get very high scores because most of the items are measuring the same thing. Similarly, examinees who don’t know very much will do very badly because they’ll fail across the board on similar sorts of items (Popham, p.134). “The Kuder-Richardson method, as is the case with all internal consistency estimates, focuses on the degree to which the items in the test are functioning in a homogeneous fashion (Popham, 135). Table 1 presents the results of the KR20 procedure applied to the ALWQ scores.

Table 1

KR20 Coefficients, Means and Variances for the ALWQ

Scores	KR20 Coefficient	Mean	Variance
ALWQ Pre-test	.28	28.15	10.00
ALWQ Post 1	.69	29.22	21.48
ALWQ Post 2	.59	28.92	16.60

Correction for Attenuation

Because the reliability estimates for the ALWQ are low to moderately high therefore bringing into question the ability of the instrument to produce internally consistent scores from the population sample used in this study, the correction for attenuation formula was used to estimate what the correction between tests would have been if the variables had been perfectly reliable with no measurement error. The formula used for correcting attenuation was:

$$\rho_{x_t y_t} = \rho_{x_i y_j} / \sqrt{\rho_{xx'} \rho_{yy'}}$$

where $\rho_{x_t y_t}$ is the correlation corrected for attenuation; $\rho_{x_i y_j}$ is the observed correlation; $\rho_{xx'}$ is the reliability of X; and $\rho_{yy'}$ is the reliability of Y (Carmines & Zeller, 1979).

Table 2 presents the results of the correction for attenuation for the KR-20 coefficients on the ALWQ.

Table 2

Corrections for Attenuation

Variables	Pearson r	Corrected Correlation
X = ALWQ pre	.35	.80
Y= ALWQ Post 1		
X = ALWQ Post 1	.67	1.08*
Y= ALWQ Post 2		
X = ALWQ pre	.38	.93
Y= ALWQ Post 2		

*The correlation of ALWQ Post 1 with ALWQ Post 2 did not warrant correction, as indicated by a corrected coefficient > 1.00.

Table 3 presents the Pearson r correlation coefficients for the ALWQ.

Table 3

ALWQ Pearson Correlations

		ALWQ Pre Sum	ALWQ Post 1 Sum	ALWQ Post 2 Sum
ALWQ Pre Sum	Pearson Correlation	1.000	.350**	.377**
	Sig. (1-tailed)	.	.004	.002
	N	65	65	65
ALWQ Post 1 Sum	Pearson Correlation	.350**	1.000	.686**
	Sig. (1-tailed)	.004	.	.000
	N	65	65	65
ALWQ Post 2 Sum	Pearson Correlation	.377**	.686**	1.000
	Sig. (1-tailed)	.002	.000	.
	N	65	65	65

** Correlation is significant at the 0.01 level (1-tailed).

Testing of Assumptions for Analysis of Variance

“In a simple one-way between-subjects ANOVA, problems created by unequal group sizes are relatively minor. However, if sample sizes are very different, the assumption of homogeneity of variance is more difficult to meet. If the group with the smaller n has the larger variance, the F test is too liberal, leading to increased Type 1 error rate and an inflated alpha level.” (Tabachnick & Fidell, 1989, p. 48).

The assumption of normality on the ALWQ Pretest, Post 1 test, and Post 2 test was tested using boxplots.

Levene's Test for Equality of Variances

Homogeneity of variance, the assumption that each category of the independent variable has the same variance on an interval dependent, was tested using Levene's test of homogeneity of variance (SPSS version 8.0 for Windows, 1998). The ALWQ Post 1 shows an F coefficient that is significant at the $p < .05$ level, but the slight inequality of variance is not enough to violate the assumption being tested. The results are shown in Table 4.

Table 4

Levene's Test for Equality of Variances

	F	Significance
ALWQ Pre	.471	.495
ALWQ Post 1	4.314	.042
ALWQ Post 2	.121	.729

Equal variances assumed when $p < .05$.

Scatterplots

The assumption of linearity was tested by inspecting scatterplots because the General Linear Model (GLM) assumes linearity. The results are shown in Figure 1.

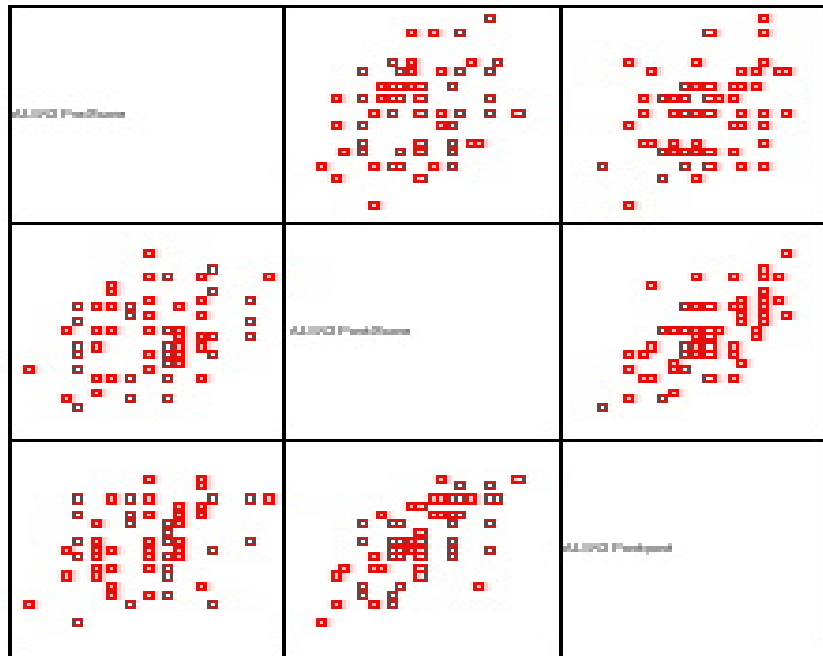


Figure 1. Scatterplot Matrix for ALWQ

t-test for Equality of Means

With the assumptions of normality, homogeneity of variance and linearity met, a t-test for independent samples ($\alpha = 0.05$) was applied to determine if there was a significant difference between group means on the ALWQ. The t-test, equal variances assumed, yielded a significant difference between group means on the ALWQ Post 1 and Post 2 scores. Table 5 presents the results of the t-test for independent samples ($p < .05$) comparing the Post 1 and Post 2 test results for both groups.

Table 5

t-test for Independent Samples Equality of Means

	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence	
						Interval of the	
						Lower	Upper
ALWQ Pre	-1.01	63	.32	-1.95	1.94	-5.82	1.92
ALWQ Post 1	4.80	63	.00	12.14	2.53	7.08	17.19
ALWQ Post 2	2.65	63	.01	6.33	2.39	1.56	11.10
p < .05 (2-tailed)							

Analysis of Variance

In addition to the t-test for group differences between the means, a one-way analysis of variance (ANOVA) (SPSS, 1998) was performed on each dependent variable (ALWQ Post 1 and ALWQ Post 2) to determine the total variance of the array of scores per test administration. Table 6 presents the results of the two univariate ANOVAs showing that the between group differences at both test administrations (i.e., immediately and at two months following treatment) were significant at the 0.05 level.

Table 6

One-Way Analysis of Variance

ALWQ Post 1	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2380.00	1	2380.00	23.03	.00
Within Groups	6511.14	63	103.35		
Total	8891.14	64			

ALWQ Post 2					
Between Groups	646.98	1	646.98	7.03	.01
Within Groups	5795.27	63	91.99		
Total	6442.246	64			

p < .05

Analysis of Covariance is used primarily as a procedure for the statistical control of an extraneous variable. ANCOVA, which combines regression analysis and Analysis of Variance (ANOVA), controls for the effects of this extraneous variable, called a covariate, by partitioning out the variation attributed to this additional variable. In this way the researcher is better able to investigate the effects of the primary independent variables. In order for ANCOVA to be effective, the covariate must be linearly related to the dependent variable, and must be unaffected by other independent variables. By statistically controlling for the variation attributed to the covariate, the researcher increases the precision of the research by reducing error variance. (Hinkle et al., 1994, p.484)

APPENDIX F

AGED

Instructions

We are interested in how you would characterize the “average,” or “typical” employee between the ages of 50 and 62 yrs.. We realize that every human being is unique and that it is difficult to generalize about a particular group. However, it is also true that an “average” does exist for any group. Try to keep the “average” employee between the ages of 50 and 62 yrs. in mind as you complete this questionnaire.

On the page after these instructions you will find listed a series of bipolar adjectives, each accompanied by a scale. You are asked to place a mark along the scale at a point, which, in your opinion, best describes the “average” employee between the ages of 50 and 62 yrs.

Here is an example of how you are to use the scales:

If you feel that the “average” employee between the ages of 50 and 62 yrs. is very close to one end of the scale you should place your mark as follows:

talkative : X : _____ : _____ : _____ : _____ : _____ : _____ : quiet

OR

talkative : _____ : _____ : _____ : _____ : _____ : _____ : X : quiet

If you feel that the “average” employee between the ages of 50 and 62 yrs. is quite close to one or the other end of the scale (but not extremely close) you should place your mark as follows:

dominant : _____ : X : _____ : _____ : _____ : _____ : _____ : submissive

OR

dominant : _____ : _____ : _____ : _____ : _____ : X : _____ : submissive

cowardly : ____ : ____ : **X** : ____ : ____ : ____ : ____ : brave

cowardly : ____ : ____ : ____ : ____ : **X** : ____ : ____ : brave

fat : ____ : ____ : ____ : **X** : ____ : ____ : ____ : thin

1) Place your marks in the middle of the spaces not on the boundaries.

this
not this

: _____: **X** : _____: _____: _____:
~~**X**~~ _____:

- Please mark each item as a separate and independent judgment. Do not try to remember how you have marked earlier items even though they may seem to have been similar. It is your first impression or immediate reaction about each item that is wanted.

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considerate	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	inconsiderate
independent	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	dependent
boastful	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	modest
hopeful	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	dejected
dishonest	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	honest
sexless	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	sexy
trustful	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	suspicious
inflexible	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	flexible
impatient	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	patient
expectant	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	resigned
other-oriented	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	self-oriented
unproductive	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	productive
insincere	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	sincere
active	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	passive
satisfied	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	dissatisfied
unsociable	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	sociable
sensitive	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	insensitive
timid	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	assertive
undignified	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	dignified
imaginative	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	unimaginative
foolish	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	wise
busy	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	idle
temperamental	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	even-tempered
involved	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	apathetic
generous	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	selfish
cautious	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	adventurous
demanding	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	accepting
optimistic	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	pessimistic

STATISTICS

Reliability

Cronbach's Alpha

Cronbach's Alpha procedure was applied to the AGED, a seven-point semantic differential instrument that uses two non-overlapping sets of adjective pairs to assess age stereotypes and attitudes toward age-specific targets (Issac & Michael, 1995). The scores generated by the AGED are considered nondichotomous; therefore, Cronbach's Alpha coefficient "is a more generalizable estimate of the internal-consistency form of reliability and can be used with test items that yield other than binary scored responses (Crocker & Algina, 1986; Popham, 1990, p.135). Table 1 presents the results of Cronbach's Alpha procedure applied to the AGED scores by subscale and subscale sum.

Table 1

Cronbach's Alpha Coefficients, Means and Variances for the AGED Inventory with
Negatively Correlated Items Removed

Scores	Alpha	Stand.	Item Means		Item Variances	
		Alpha	Mean	Variance	Mean	Variance
Pretest SUM	.20	.19	13.53	16.99	17.40	25.71
- Goodness	.51	.52	3.08	3.02	1.54	.03
- Positive	.66	.66	2.78	.10	2.32	.17
- Vitality	.65	.66	2.75	.30	2.59	.53
- Maturity	.62	.60	4.91	.44	2.80	1.33
Post 1 SUM	.42	.45	11.80	28.56	14.39	22.63
- Goodness	.72	.73	2.21	.03	1.31	.10
- Positive	.79	.79	2.62	.04	1.86	.07
- Vitality	.57	.57	2.72	.14	2.17	.02
- Maturity	.60	.57	4.82	.41	2.26	.62
Post 2 SUM	.51	.46	11.33	8.17	11.32	26.09
- Goodness	.68	.68	2.43	.01	.88	.00
- Positive	.83	.84	3.03	.04	1.50	.02
- Vitality	.75	.75	2.98	.25	1.61	.01
- Maturity	.57	.55	4.67	.05	2.02	.29

Correction for Attenuation

Because the reliability estimates for both the AGED are low to moderately high therefore bringing into question the ability of either instrument to produce internally consistent scores from the population sample used in this study, the correction for attenuation formula was used to estimate what the correction between tests would have been if the variables had been perfectly reliable with no measurement error. The formula used for correcting attenuation was:

$$\rho_{x_t y_t} = \rho_{x_i y_j} / \sqrt{\rho_{xx'} \rho_{yy'}}$$

where $\rho_{x_t y_t}$ is the correlation corrected for attenuation; $\rho_{x_i y_j}$ is the observed correlation; $\rho_{xx'}$ is the reliability of X; and $\rho_{yy'}$ is the reliability of Y (Carmines & Zeller, 1979).

Table 2 shows the corrected Cronbach's Alpha coefficients.

Table 2

Corrections for Attenuation

Variables	Pearson r	Corrected Correlation
X = AGED pre Y= AGED Post 1	.19	.67
X = AGED Post 1 Y= AGED Post 2	.06	.13
X = AGED Pre Y= AGED Post 2	.55	1.72*

*The correlation of AGED Pre with AGED Post 2 did not warrant correction, as indicated by a corrected coefficient > 1.00.

Pearson r Correlations

Table 3 presents the Pearson r correlation coefficients for the AGED.

Table 3

AGED Pearson Correlations

		AGED	AGED	AGED
		Pre Sum	Post 1 Sum	Post 2 Sum
AGED Pre Sum	Pearson Correlation	1.000	.194	.554**
	Sig. (1-tailed)	.	.061	.000
	N	65	65	65
AGED Post 1 Sum	Pearson Correlation	.194	1.000	.056
	Sig. (1-tailed)	.061	.	.328
	N	65	65	65
AGED Post 2 Sum	Pearson Correlation	.554**	.056	1.000
	Sig. (1-tailed)	.000	.328	.
	N	65	65	65

** Correlation is significant at the 0.01 level (1-tailed).

Testing of Assumptions for Analysis of Variance

The assumptions of normality, homogeneity of variance, and linearity were tested prior to application of the two univariate ANOVAs and the Repeated Measures ANCOVA. The assumption of normality on the AGED Inventory Pretest, Post 1 test, and Post 2 test was tested using boxplots.

Levene's Test for Equality of Variances

Homogeneity of variance, the assumption that each category of the independent variable has the same variance on an interval dependent, was tested using Levene's test of homogeneity of variance (SPSS version 8.0 for Windows, 1998). There were no significant F coefficients; therefore, the variances were assumed to be equal. The results are shown in Table 4.

Table 4

Levene's Test for Equality of Variances

	F	Significance
AGED Pre	.26	.61
AGED Post 1	.19	.67
AGED Post 2	.15	.70

Equal variances assumed when $p < .05$.

Scatterplots

The assumption of linearity was tested by inspecting scatterplots because the General Linear Model (GLM) assumes linearity. The results are shown in Figure 1.

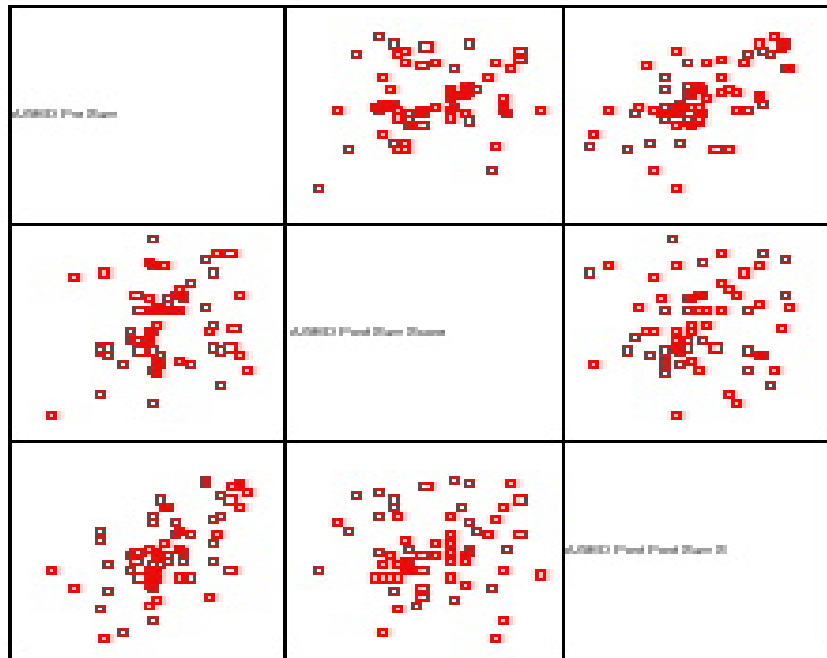


Figure 1. Scatterdiagrams for AGED Inventory

t-test for Equality of Means

With the assumptions of normality, homogeneity of variance and linearity met, a t-test for independent samples ($\alpha = 0.05$) was applied to determine if there was a significant difference between group means on the AGED Inventory. The t-test, equal variances assumed, yielded no significant differences between group means on the AGED Inventory Post 1 and Post 2 scores. Table 5 presents the results of the t-test for independent samples ($p < .05$).

Table 5

t-test for Independent Samples Equality of Means

						95% Confidence	
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval of the Difference	
						Lower	Upper
AGED Pre	-.03	63	.97	-7.62E-02	2.27	-4.62	4.46
AGED Post 1	-.49	63	.63	-1.11	2.29	-5.68	3.46
AGED Post 2	.89	63	.38	1.90	2.14	-2.36	6.17
<hr/>							
p < .05 (2-tailed)							

Analysis of Variance

In addition to the t-test for group differences between the means, a one-way analysis of variance (ANOVA) (SPSS, 1998) was performed on each dependent variable (AGED Inventory Post 1 and AGED Inventory Post 2) to determine the total variance of the array of scores per test administration. Table 6 presents the results of the two univariate ANOVAs showing that there were no significant differences detected between groups ($p < .05$).

Table 6

One-Way Analysis of Variance

AGED Post 1	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	19.89	1	19.89	.235	.629
Within Groups	5327.65	63	84.57		
Total	5347.53	64			

AGED Post 2					
Between Groups	58.61	1	58.61	.796	.376
Within Groups	4641.24	63	73.67		
Total	4699.85	64			

p < .05

Analysis of Covariance is used primarily as a procedure for the statistical control of an extraneous variable. ANCOVA, which combines regression analysis and Analysis of Variance (ANOVA), controls for the effects of this extraneous variable, called a covariate, by partitioning out the variation attributed to this additional variable. In this way the researcher is better able to investigate the effects of the primary independent variables. In order for ANCOVA to be effective, the covariate must be linearly related to the dependent variable, and must be unaffected by other independent variables. By statistically controlling for the variation attributed to the covariate, the researcher increases the precision of the research by reducing error variance. (Hinkle et al., 1994, p.484)

REFERENCES

- Adamchak, D. J. (1993). Demographic aging in the industrialized world: A rising burden? Generations, 17(4), 6-9.
- Aday, R. H., & Campbell, M. J. (1995). Changes in nursing students' attitudes and work preferences after a gerontology curriculum. Educational Gerontology, 21(3), 247-260.
- Allport, G. W. (1958). The nature of prejudice (Abridged ed.). Garden City, NY: Doubleday Anchor Books.
- American Association of Retired Persons. (1995). American business and older workers: A road map to the 21st century. Washington, DC: American Association of Retired Persons.
- American Association of Retired Persons Workforce Programs Department. (1993). How to train older workers. Washington, DC: American Association of Retired Persons.
- Arthur, W., Fuentes, R., & Doverspike, D. (1990). Relationships among personnel tests, age, and job performance. Experimental Aging Research, 16(1), 11-16.
- Babic, A. L., & Crangle, M. L. (1987). Simulation techniques for education in gerontology: An exercise in experiential learning. Educational Gerontology, 13, 183-191.
- Baldi, R. A. (1997). Training older adults to use the computer: Issues related to the workplace, attitudes, and training. Educational Gerontology, 23(5), 453-465.
- Barber, C. E. (1992, February 28). Developing gerontological education/training programs for business and industry: What are the most salient aging workforce issues to address? Poster session presented at the annual meeting of the Association of Gerontology in Higher Education, Baltimore.
- Barber, C. E. (1992, July/August). Delphi method can help companies forecast aging-workforce issues. Aging Today, 13-14.
- Barlow, J. (Ed.) (1997, May). Teaching older people new skills easier than previously believed. In News from the University of Illinois at Urbana-Champaign May 1997 Tip Sheet [On-line]
Available: <http://www.admin.uiuc.edu/NB/97.05/9705agingtip.html>

Barkin, S. (1970). Retraining and job redesign: Positive approaches to the continued employment of older persons. In H. L. Sheppard (Ed.), Toward an industrial gerontology: An introduction to a new field of applied research and service (pp. 17-30). Cambridge, MA: Schenkman.

Barth, M. C., McNaught, W., & Rizzi, P. (1995). Older Americans as workers. In S.A. Bass (Ed.), Older and active: How Americans over 55 are contributing to society (pp. 35-70). New Haven: Yale University Press.

Bass, S. A. (1995). Older and active. In S.A. Bass (Ed.), Older and active: How Americans over 55 are contributing to society (pp. 1-9). New Haven: Yale University Press.

Bassett, D. S., & Jackson, L. (1994, Summer). Applying the model to a variety of adult learning situations. In L. Jackson & R.S. Caffarella (Eds.), New directions for adult and continuing education. Experiential learning: A new approach (No. 62, pp. 73-86). San Francisco: Jossey-Bass.

Belbin, R. M. (1969). The discovery method: An international experiment in retraining (Employment of Older Worker Series Rep. No. 6). Paris: Organisation for Economic Co-Operation and Development.

Belbin, R. M. (1970). The discovery method in training older workers. In H. L. Sheppard (Ed.), Toward an industrial gerontology: An introduction to a new field of applied research and service (pp. 56-60). Cambridge, MA: Schenkman.

Berkowitz, M. (1988). Functional ability and job performance as workers age. In M.E. Borus, H.S. Parnes, S.H. Sandell, & B. Seidman (Eds.), The older worker. Madison, WI: Industrial Relations Research Association.

Bischof, L. (1964). Interpreting personality theories. New York: Harper & Row.

Bové, R. (1987). Retraining the older worker. Training and Development Journal, 41(3), 76-78.

Bower, G. H. & Hilgard, E. R. (1981). Theories of learning (5th ed.). Englewood Cliffs, NJ: Prentice-Hall.

Braithwaite, V., Gibson, D., & Holman, J. (1986). Age stereotyping: Are we oversimplifying the phenomenon? International Journal on Aging and Human Development, 22(4), 315-325.

Bredemeier, M., & Greenblat, C. (1981). The educational effectiveness of simulation games. Simulation & Games, 12, 307-331.

Brinkerhoff, R.O. (1987). Achieving results from training. San Francisco: Jossey-Bass.

Brubaker, T. H., & Powers, E. A. (1976). The stereotype of "old": A review and alternative approach. Journal of Gerontology, 31(4), 441-447.

Butler, R. N. (1987). Ageism. In G. L. Maddox (Editor-in-Chief), The encyclopedia of aging, (pp. 22-23). New York: Springer.

Butler, R.N. (1993, Spring/Summer). Dispelling ageism: The cross-cutting intervention. Generations, 17(3), 75-78.

Caffarella, R. S., & Barnett, B. G. (1994, Summer). Characteristics of adult learners and foundations for experiential learning. In L. Jackson & R.S. Caffarella (Eds.), New directions for adult and continuing education: Experiential learning: A new approach (No. 62, pp. 29-42). San Francisco: Jossey-Bass.

Campbell, D. T., & Stanley, J. C. (1963). Experimental and quasi-experimental designs for research. Chicago: Rand McNally College Publishing.

Carmel, S., Cwikel, J., & Galinsky, D. (1992). Changes in knowledge, attitudes, and work preferences following course in gerontology among medical, nursing, and social work students. Educational Gerontology, 18(4), 329-342.

Carmines, E. G., & Zeller, R. A. (1979). Reliability and validity assessment. In J.L. Sullivan (Ed.), Quantitative applications in the social sciences: A Sage university paper. Beverly Hills, CA: Sage.

Carnevale, A. P., & Stone, S. C. (1994). Developing the new competitive workforce. In J.A. Auerbach & J.C. Welsh (Eds.), Aging and competition: Rebuilding the U.S. workforce (pp. 94-144). Washington, DC: The National Council on the Aging, Inc., and the National Planning Association.

Cattell, R.B. (1944). Psychological measurement: Normative, ipsative, interactive. Psychological Review, 51, 292-303.

Caudron, S. (1997). Boomers rock the system. Workforce, 76(12), 42-47.

Clark, S.K. (1994). Training implications for our graying work force. Performance & Instruction, 33 (1), 30-32.

Claxton, C. S., & Murrell, P. H. (1996). Learning styles. ERIC Digest (Report ED301143 88). Washington, DC: ERIC Clearinghouse on Higher Education. [On-line]. Available: http://inet.ed.gov/databases/ERIC_Digests/ed301143.html

Cleveland, J. N., & Hollman, G. (1990). The effects of the age-type of tasks and incumbent age composition on job perceptions. Journal of Vocational Behavior, 36, 181-194.

Cleveland, J. N., Shore, L. M., & Murphy, K. R. (1997). Person- and context-oriented perceptual age measures: Additional evidence of distinctiveness and usefulness. Journal of Organizational Behavior (UK), 18(3), 239-251.

Cohen, J. (1977). Statistical power analysis for the behavioral sciences. (Rev. ed.). New York: Academic Press.

Cornwell, J. M., & Manfreda, P. A. (1994). Kolb's learning style theory revisited. Educational and Psychological Measurement, 54(2), 317-327.

Craft, J. A., Doctors, S. I., Yitzchak, M. S., & Benecki, T. J. (1979). Simulated management perceptions, hiring decisions and age. Aging and Work, 2(1), 95-100.

Crocker, L., & Algina, J. (1986). Introduction to classical and modern test theory. Fort Worth, TX: Harcourt Brace Jovanovich College Publishers.

Czaja, S. J. (1995). Aging and work performance. Review of Public Personnel Administration, 15 (2), 46-61.

Davis, K. (1995). Foreword. In S.A. Bass (Ed.), Older and active: How Americans over 55 are contributing to society (pp. vii-viii). New Haven: Yale University Press.

Decenzo, D.A., & Robbins, S.P. (1999). Human resource management (6th ed.). New York: John Wiley & Sons.

Deets, H. B. (1999, May-June). Age discrimination still on the rise. Modern Maturity, p. 80.

Delatte, A. P., & Baytos, L. (1993). Eight guidelines for successful diversity training. Training, 30(1), 55-60.

Dempsey-Lyle, S., & Hoffman, T. L. (1991). Into aging: Understanding issues affecting later stages in life (2nd ed.). Director's manual. Thorofare, NJ: Slack.

Dickinson, J. R., & Faria, A. J. (1997). A random strategy criterion for validity of simulation game participation. Simulation & Games, 28 (3), 263-275.

Dixon, N. M. (1990). Evaluation: A tool for improving HRD quality. San Diego, CA: University Associates.

Doering, M., Rhodes, S. R., & Schuster, M. (1983). The aging worker: Research and recommendations. Beverly Hills, CA: Sage.

Driver, M. J. (1994). Workforce personality and the new information age workplace. In J.A. Auerbach & J.C. Welsh (Eds.), Aging and competition: Rebuilding the U.S. workforce (pp. 185-204). Washington, DC: The National Council on the Aging, Inc. and the National Planning Association.

Dychtwald, K. (1990). Age wave: How the most important trend of our time will change your future. New York: Bantam Books.

Elliott, R. H. (1995). Human resource management's role in the future aging of the workforce. Review of Public Personnel Administration, 15 (2), 5-17.

Endorf, M., & McNeff, M. (1991). The adult learner: Five types. Adult Learning, 2(7), 20-22, 25.

Faria, A. J. (1987). A survey of the use of business games in academia and businesses. Simulation & Games, 18, 207-224.

Flynn, G. (1997). Aging baby boomers may mean more lawsuits. Workforce, 76(12), 105-106.

Fraboni, M., Saltstone, R. & Hughes, S. (1990). The Fraboni Scale of Ageism (FSA): An attempt at a more precise measure of ageism. Canadian Journal on Aging/La revue canadienne du vieillissement, 9(1), 56-66.

Fullerton, Jr., H. N., (1997). Labor force 2006: Slowing down and changing composition. Monthly Labor Review, 120(11), 23-38.

Fyock, C. D. (1991). Teaching older workers new tricks. Training & Development Journal, 45(4), 21-23.

Galagan, P. A., & Cummins, T. W. (1993). Trading places at monsanto: Special Report of the ASTD board of governors symposium held in October, 1992. Training & Development, 47(4), 28-60.

Galbraith, M. W. (1990). The aging, learning and work quiz. Journal of Industrial Teacher Education, 28(1), 52-69.

Galbraith, M. W., & Venable, W. R. (1985). Perceptions of national leaders in three professional associations about aging, learning, and work. Educational Gerontology, 11(2-3) 145-153.

Gardner, D. L., & Benzing, P. (1990). Age-related sensory changes: Using simulations in geriatric education. Educational Gerontology, 16, 535-545.

Garfein, A. J., Schaie, K. W., & Willis, S. L. (1988). Microcomputer proficiency in later-middle-aged and older adults: Teaching old dogs new tricks. Social Behavior, 3, 131-148.

Gaullier, X. (1990). What future for older workers? Ageing International, 16(1), 16-22.

Gekoski, W. L., Knox, V. J., & Kelly, L. E. (1991). The factor structure of the aging semantic differential: A failure to replicate Rosencranz and McNevin. Journal of Social Psychology, 131, 593-595.

Gilsdorf, J. W. (1992). The new generation: Older workers. Training & Development, 46(3), 77-79.

Given, B. K. (1996). Learning styles: A synthesized model. Journal of Accelerative Learning and Teaching, 21 (1 & 2), pp. 7+. [On-line]. Available: <http://crab.rutgers.edu/Camden/TEC/JALT/SpringHTMLJALT/SpringJALT.html>

Goddard, R. W. (1987). How to harness America's gray power. Personnel Journal, 66(5), 33-40.

Goldberg, B. (2000). Age works: What corporate America must do to survive the graying of the workforce. New York: The Free Press.

Goldstein, I. L. (1974). Training: Program development and evaluation. Monterey, CA: Brooks/Cole.

Gordon, S. E. (1994). Systematic training program design: Maximizing effectiveness and minimizing liability. Englewood Cliffs, NJ: PTR Prentice-Hall.

Green, S. K. (1981). Attitudes and perceptions about the elderly: Current and future perspectives. International Journal on Aging and Human Development, 13(2), 99-119.

Gunsch, D. (1993). Games augment diversity training. Personnel Journal, 72, 78-83.

Hale, N. (1990). The older worker: Effective strategies for management and human resource development (The Jossey-Bass Management Series). San Francisco: Jossey-Bass.

Hall, D. T., & Mirvis, P. H. (1994). The new workplace and older workers. In J.A. Auerbach & J.C. Welsh (Eds.), Aging and competition: Rebuilding the U.S. workforce (pp. 58-93). Washington, DC: The National Council on the Aging, Inc. and the National Planning Association.

Harkness, H. (1999). Don't stop the career clock: Rejecting the myths of aging for a new way to work in the 21st century. Palo-Alto, CA: Davies-Black.

Hassell, B. L., & Perrewe, P. L. (1995). An examination of beliefs about older workers: Do stereotypes still exist? Journal of Organizational Behavior, 16(5), 457-468.

Hayslip, B., Miller, C., Beyerlein, M. M., Johnson, D., Metheny, W., & Yeatts, D. (1996). Employee age and perceptions of work in self-managing and traditional work groups. International Journal on Aging and Human Development, 42 (4), 291-312.

Helberg, C. (1995). Pitfalls of data analysis: Or how to avoid lies and damned lies. Paper presented at the Third International Applied Statistics in Industry conference, Dallas, TX [On-line]. Available: <http://maddog.fammed.wisc.edu/pitfalls/>

Hicks, L. E. (1970). Some properties of ipsative, normative, and forced-choice normative measures. Psychological Bulletin, 74(3), 167-184.

Highhouse, S., & Doverspike, D. (1987). The validity of the Learning Style Inventory 1985 as a predictor of cognitive style and occupational preference. Educational and Psychological Measurement, 47, 749-753.

Hinkle, D. E., Wiersma, W., & Jurs, S. G. (1994). Applied statistics for the behavioral sciences (3rd ed.). Boston: Houghton Mifflin.

Howard, P. J. (1994). The owner's manual for the brain: Everyday applications from mind-brain research. Austin, TX: Leornian Press.

Hube, K. (1999, Dec. 15). Is a big salary in your future? Wall Street Journal Interactive Edition. [On-line]. Available: <http://public.wsj.com/careers/resources/documents/19991215-hube.htm>.

Huck, S. W., Cormier, W. H., & Bounds, W. G. (1974). Reading statistics and research. New York: HarperCollins.

Hunt, M. (1993). The story of psychology. New York: Doubleday.

Imel, S. (1996). Older workers: Myths and realities. In ERIC Clearinghouse on Adult, Career, and Vocational Education [On-line]. Available: <http://www.coe.ohio-state.edu/cete/ericacve/docs/olderw.htm>

Intrieri, R. C., Kelly, J. A., Brown, M. M., & Castilla, C. (1993). Improving medical students' attitudes toward and skills with the elderly. The Gerontologist, 33(3), 373-378.

Issac, S., & Michael, W. B. (1995). Handbook in research and evaluation: A collection of principles, methods, and strategies useful in the planning, design, and evaluation of studies in education and the behavioral sciences (3rd ed.). San Diego, CA: Educational and Industrial Testing Service.

Johnson, J. J. (1994). Cognition and aging: A practical analysis. Performance & Instruction, 33 (1), 33-35.

Jones, E. E., Jr. (1984). Nine tips for training older workers. Training and Development Journal, 38(3),12-13.

Jöreskog, K., & Sörbom, D. (1993). Lisrel 8: Structural equation modeling with the simplis command language. Chicago, IL: Scientific Software International.

Kaeter, M. (1995). Age-old myths. Training, 32(1), 61-64.

Kaminski, V. (1983). Designing a seminar for managers of older workers. Training and Development Journal, 37(7),36-39.

Kanter, R. M. (1977). Men and women of the corporation. New York: Basic Books, A Division of HarperCollins.

Karp, H. B., & Sutton, N. (1993). Where diversity training goes wrong. Training, 30(7), 30-34.

Katz, R. S. (1990a). Interdisciplinary gerontology education: Impact on multidimensional attitudes toward aging. Gerontology & Geriatrics Education, 10(3), 91-100.

Katz, R. S. (1990b). Personality trait correlates of attitudes toward older people. International Journal on Aging and Human Development, 31(2), 147-159.

Kennedy, M. M. (1999). Managing change: Understanding the demographics of the evolving workforce. [On-line]. Available: <http://www.moatskennedy.com/home.htm>

Kerlinger, F. N. (1986). Foundations for Behavioral Research (3rd ed.). Fort Worth, TX: Holt, Rinehart and Winston.

Kernerer, R. W. & Wahlstrom, M. (1984). How well does the older adult fare on competence measures? Performance & Instruction Journal, 23(10), 30-32.

Kimmel, D. C. (1988). Ageism, psychology, and public policy. American Psychologist, 43, 175-178.

Kirk, J. J. (1997). Trainers' use of games: Some preliminary explorations. Simulation and Games, 28 (1), 88-97.

Kirk, R. E. (1995). Experimental design: Procedures for the behavioral sciences (3rd ed.). Pacific Grove, CA: Brooks/Cole.

Kite, M. E., Deaux, K., & Miele, M. (1991). Stereotypes of young and old: Does age outweigh gender? Psychology and Aging, 6(1), 19-27.

Knox, J. V., Gekoski, W. L., & Johnson, E. A. (1986). Contact with and perceptions of the elderly. The Gerontologist, 26, 309-313.

Knox, J. V., Gekoski, W.L., & Kelly, L. E. (1995). The age group evaluation and description (AGED) inventory: A new instrument for assessing stereotypes of and attitudes toward age groups. International Journal of Aging and Human Development, 40(1), 31-55.

Kochan, T. A. (1996). The American corporation as an employer: Past, present, and future possibilities. In C. Kaysen (Ed.), The American corporation today: Examining the questions of power and efficiency at the century's end (pp. 242-268). New York: Oxford University Press.

Krueger, J., Heckhausen, J., & Hundertmark, J. (1995). Perceiving middle-aged adults: Effects of stereotype-congruent and incongruent information. Journals of Gerontology Series B Psychological Science and Social Sciences, 50B(2), P82-P93.

Langer, E. J. (1989). Mindfulness. Reading, MA: Addison-Wesley.

Langer, E. J. (1997). The power of mindful learning. Reading, MA: Addison-Wesley.

Langer, N. (1995). Into aging: Review. Simulation & Gaming, 26(2), 261-263.

Lawrence, B. S. (1988). New wrinkles in the theory of age: Demography, norms and performance ratings. Academy of Management Journal, 31(2), 309-337.

Lee, J. A., & Clemons, T. (1985). Factors affecting employment decisions about older workers. Journal of Applied Psychology, 70(4), 785-788.

Lee, P., & Caffarella, R. S. (1994). Methods and techniques for engaging learners in experiential learning activities. In L. Jackson & R. S. Caffarella (Eds.), New directions for adult and continuing education. Experiential learning: A new approach (No. 62, pp. 43-54). San Francisco: Jossey-Bass.

Lerman, R. I. & Schmidt, S.R. (1999, August). An overview of economic, social, and demographic trends affecting the U.S. labor market: Final report. Washington, DC: The Urban Institute.

Lewis, L. H., & Williams, C. J. (1994). Experiential learning: Past and present. In L. Jackson & R. S. Caffarella (Eds.), New directions for adult and continuing education. Experiential learning: A new approach (No. 62, pp. 5-16). San Francisco: Jossey-Bass.

Library and Reference Services Division of the Educational Testing Service (1993, February). Aging, learning, and work quiz (ETS Tracking Number TC017924). [On-line]. Available: <http://ericae.net/tc2/tc017924.htm>

Linstone, H. A., & Turoff, M. (1975). Introduction. In H. A. Linstone & M. Turoff (Eds.), The Delphi method: Techniques and applications (pp. 3-12). Reading, MA: Addison-Wesley.

Lipsey, M. W. (1990). Design sensitivity: Statistical power for experimental research. Thousand Oaks, CA: Sage.

Litwin, G.H. (1970). Achievement motivation and the older worker. In H.L. Sheppard (Ed.), Toward an industrial gerontology: An introduction to a new field of applied research and service (pp. 61-70). Cambridge, MA: Schenkman.

Locke, E. A. (1986). Generalizing from laboratory to field settings: Research findings from industrial-organizational psychology, organization behavior, and human resource management. Washington, DC: Lexington Books.

Loftin, L. B. & Madison, S. Q. (1991). The extreme dangers of covariance corrections. In B. Thompson (Ed.), Advances in educational research: Substantive findings, methodological developments (Eds.). The Annual Series of the Southwest Educational Research Association (Vol. 1, pp. 133-147). Greenwich, CT: JAI Press.

London, M., & Greller, M. M. (1991). Demographic trends and vocational behavior: A twenty year retrospective and agenda for the 1990s. Journal of Vocational Behavior, 38(2), 125-164.

MacManus, S. A. (1997). The nation's changing age profile: What does it mean? In E.D. Thau & J.S. Heflin (Eds.), Generations apart: Xers vs. boomers vs. the elderly (pp. 110-139). New York: Prometheus Books.

- McCarthy, B. (1987). The 4MAT system: teaching to learning styles with right/left mode techniques. Barrington, IL: Excel.
- Markson, E. W., Pratt, F., & Taylor, S. (1989). Teaching gerontology to the business community: Project older consumer. Educational Gerontology, 15(3), 285-295.
- Marshall, J. C., & Merritt, S. L. (1985). Reliability and construct validity of alternate forms of the Learning Style Inventory. Educational and Psychological Measurement, 45, 931-937.
- Marte, A. L. (1988). How does it feel to be old? Simulation game provides “into aging” experience. The Journal of Continuing Education in Nursing, 19(4), 166-168.
- McLagan, P. (1989). The models. Alexandria, VA: The American Society for Training and Development.
- McLeish, K. (1993). Prejudice. In K. McLeish (Ed.), Key ideas in human thought (p. 589). New York: Facts on File.
- McTavish, D.G. (1982). Perceptions of old people. In D. J. Mangen, and W. A. Peterson (Eds.), Research instruments in social gerontology : Vol. 1, Clinical and social psychology (pp. 533-621). Minneapolis: University of Minnesota Press.
- Merritt, S. L., & Marshall, J. C. (1984). Reliability and construct validity of ipsative and normative forms of the Learning Style Inventory. Educational and Psychological Measurement, 44, 463-472.
- Mintz, F. (1986). Graying of the training room. Personnel, 63(10), 69-71.
- Morley, J. E. (1998). Aging games we play. In N. Tumosa (Ed.), Aging successfully, 8 (1), 1-2, 8.
- Moseley, J. L., & Dessinger, J. C. (1994). Criteria for evaluating instructional products and programs for older adult learners. Performance & Instruction, 33 (3), 39-45.
- Mosher-Ashley, P. M. (1995). Use of simulations in gerontological and geriatric training: A review. Gerontology & Geriatrics Education, 16(2), 53-72.
- Murrell, K. F. H. (1970). Major problems of industrial gerontology. In H. L. Sheppard (Ed.), Toward an industrial gerontology: An introduction to a new field of applied research and service (pp. 71-83). Cambridge, MA: Schenkman.
- National Committee on Careers for Older Americans. (1979). Older Americans: An untapped resource. Washington, DC: Academy for Educational Development.

Noble, K. A., & Rancourt, R. (1988). What knowledge-accessing modes tell administrators about interdisciplinary crises and conflicts. Journal of Health Administration in Education, 5(4), 595-605.

Nusberg, C. (1990). Job training for older workers lags in the industrialized world. Ageing International, 16(1), 23-30.

Nydegger, C. N. (1987). Cohorts. In G.L. Maddox (Editor-in-Chief), The encyclopedia of aging (pp. 127-129). New York: Springer.

O'Brien, F. P., Robinson, J. F., & Taylor, G. S. (1986). The effects of supervisor sex and work environment on attitude toward older employees. Public Personnel Management, 15 (2), 119-130.

O'Brien, T. P. (1990). Construct validation of the Gregorc Style Delineator: An application of Lisrel 7. Educational and Psychological Measurement, 50, 631-636.

Palmore, E. B. (1990). Ageism: Negative and positive. New York: Springer.

Peters, V., Vissers, G., & Heijne, G. (1998). The validity of games. Simulation & Gaming, 29 (1), 20-30.

Peterson, D. A., & Wendt, P. F. (1995). Training and education of older americans as workers and volunteers. In S.A. Bass (Ed.), Older and active: How Americans over 55 are contributing to society (pp. 217-236). New Haven: Yale University Press.

Peterson, P. G. (1997). Will America grow up before it grows old? In E. D. Thau & J. S. Heflin (Eds.), Generations apart: Xers vs. boomers vs. the elderly (pp. 140-151). New York: Prometheus Books.

Pfeiffer, J. W., & Ballew, A. C. (1991). The experiential learning cycle. In J. W. Pfeiffer & A. C. Ballew (Eds.), Theories and models in applied behavioral science, (Vol. 2, Group), (pp. 215-223). San Diego, CA: Pfeiffer & Company.

Pfeiffer, J. W. (1995). Perspectives on human resource development. Simulation and Gaming, 26 (2), 207-213.

Pfeiffer, J. W., & Ballew, A. C. (1988a). Using case studies, simulations and games in human resource development (UATT Series, Vol. 5). San Diego, CA: University Associates.

Pfeiffer, J. W., & Ballew, A. C. (1988b). Using role plays in human resource development (UATT Series, Vol. 4). San Diego, CA: University Associates.

Pfeiffer, J. W., & Ballew, A. C. (1988c). Using structured experiences in human resource development (UATT Series, Vol. 1). San Diego, CA: University Associates.

Phillips, J. J. (1991). Handbook of training, evaluation and measurement methods (2nd ed). Houston, TX: Gulf.

Phillips, J. J. (1996). Measuring the results of training. In R. L. Craig (Ed.), The ASTD training and development handbook: A guide to human resource development (4th ed., pp. 313-341). New York: McGraw-Hill.

Pigg, K. E., Busch, L., & Lacy, W. B. (1980). Learning styles in adult education: A study of county extension agents. Adult Education, 30(4), 233-244.

Popham, W. J. (1990). Modern educational measurement: A practitioner's perspective (2nd ed). Englewood Cliffs, NJ: Prentice-Hall.

Powers, E. A. (1982). Work and retirement. In D.J. Mangen & W.A. Peterson (Eds.), Research instruments in social gerontology : Vol. 2, Social roles and social participation (pp. 231-279). Minneapolis: University of Minnesota Press.

Pratt, M.W., & Norris, J.E. (1994). The social psychology of aging: A cognitive perspective. Cambridge, MA Blackwell Publishers.

Quinn, J.F. (1993). Is early retirement an economic threat? Generations, 17(4), 10-14.

Rancourt, R. (1986, January). The validation of an inventory to assess knowledge accessing modes in education. Paper presented at the International Seminar in Teacher Education, University of Regina, Regina, Saskatchewan.

Rancourt, R. (1989, March-April). The influence of knowledge accessing styles on the preparation of in-service education for teachers. Paper presented at The Ninth International Seminar in Teacher Education, European Information Center for Further Education of Teachers, Charles University, Prague, Czechoslovakia.

Rancourt, R., & Searle, S. Q. (1990). Golfers do it with style: Epistemic orientations of golf instructors and students. In A.J. Cochran & M.R. Farrally (Eds.), Science and golf (pp. 105-112). London: E. & F.N. Spon.

Rancourt, R., & Searle, S. Q. (1994). Teaching methods and epistemic styles of golf instructors. In A.J. Cochran & M.R. Farrally (Eds.), Science and golf (pp. 117-122). London: E. & F.N. Spon.

Raser, J. C. (1969). Simulations and society: An exploration of scientific gaming. Boston: Allyn & Bacon.

Reed, C. C., Beall, S. C., & Baumhover, L. A. (1992). Gerontological education for students in nursing and social work: Knowledge, attitudes, and perceived barriers. Educational Gerontology, 18(6), 625-636.

Reed, S. K. (1992). Cognition: Theory and applications (3rd ed.). Pacific Grove, California: Brooks/Cole..

Research and Policy Committee of the Committee for Economic Development. (1996). American workers and economic change. New York: Committee for Economic Development.

Riley, M. W., Kahn, R. L., & Foner, A. (1994). Age and structural lag: Society's failure to provide meaningful opportunities in work, family, and leisure. New York: Wiley.

Rolander, R. (1988). Older workers and HRD. In J. Wilcox (Ed.), Training and Development Journal, 42 (In practice), pp. 18-19.

Rosen, B., & Jerden, T. (1976). The influence of age stereotypes on managerial decisions. Journal of Applied Psychology, 61, 428-432.

Rosen, B., & Jerdee, T. H. (1985). A model program for combating employee obsolescence. Personnel Administrator, 30(3), 86-92.

Rosen, B., & Jerdee, T. H. (1989). Investing in the older worker. Personnel Administrator, 34(4), 70-73.

Rosenbaum, J. (1991, July 23). The pedagogic delphi: A pilot application in an introductory global studies course. Paper presented at the East-West Center Institute of Culture and Communication Summer Workshop for the Development of Intercultural Coursework at Colleges and Universities, Honolulu, HI. [On-line]. Available: <http://www.ithaca.edu/rhp/tvr/tvr1/papers/delphi.htm>

Rosencranz, H. A., & McNevin, T. E. (1969). A factor analysis of attitudes toward the aged. The Gerontologist, 9, 55-59.

Rosow, I. (1978). What is a cohort and why? Human Development, 21, 65-75.

Rossett, A., & Bickham, T. (1994). Diversity training: Hope, faith and cynicism. Training, 31(1), 40-42.

Rothstein, F.R. (Ed.) (1988). Commitment to an aging workforce: Strategies and models for helping older workers achieve full potential. Washington, DC: The National Council on Aging.

Rothwell, W. J., & Sredl, H. J. (1992). The ASTD reference guide to professional human resource development roles and competencies (2nd ed., Vol. 2). Amherst, MA: HRD Press.

Ruble, T. L., & Stout, D. E. (1990). Reliability, construct validity, and response-set bias of the revised Learning Style Inventory (LSI-1985). Educational and Psychological Measurement, 50, 619-629.

Rynes, S., & Rosen, B. (1994). What makes diversity programs work? HR Magazine, 39(10), 67-73.

Rynes, S., & Rosen, B. (1995, Summer). A field survey of factors affecting the adoption and perceived success of diversity training. Personnel Psychology, 48, 247-270.

Sackett, P. R., & Mullen, E. J. (1993). Beyond formal experimental design: Towards an expanded view of the training evaluation process. Personnel Psychology, 46, 613-627.

Saxon, J. P., & Spitznagel, R. J. (1991). The graying of America: Implications for vocational evaluation. Vocational Evaluation and Work Adjustment Bulletin, 24 (3), 113-118.

Scalera, C. V. (1999). What happens next? Examining the long-term impact of diversity education. [On-line]. Available: <http://www.inform.umd.edu/diversityweb/Digest/F99/impact.html>

Schaie, K. W. (1988). Ageism in psychology research. American Psychologist, 43, 179-183.

Schaie, K. W. (1990). Intellectual development in adulthood. In J. E. Birren & K. W. Schaie (Eds.), Handbook of the psychology of aging (3rd ed., pp. 291-309). San Diego, CA: Academic Press.

Schumacker, R. E. & Lomax, R. G. (1996). A beginner's guide to structural equation modeling. Mahwah, NJ: Lawrence Erlbaum Associates.

Shaver, N. (1977). Private industry's investment in older workers continues to pay dividends. Industrial Gerontology, 4(2), 133-136.

Shenk, D., & Lee, J. A. (1995). Meeting the educational needs of service providers: Effects of a continuing education program on self-reported knowledge and attitudes. Educational Gerontology, 21(7), 671-681.

Sheppard, H. L. (Ed.) (1970). Toward an industrial gerontology: An introduction to a new field of applied research and service (pp. 1-16). Cambridge, MA: Schenkman.

Shields, C.E., Hentges, K., & Yaney, J.P. (1990). The aging employee: Human resource management and health. Performance and Instruction, 29(5), 1-6.

Sims, R. R., Veres, J. G., Watson, P., & Buckner, K. E. (1986). The reliability and classification stability of the Learning Style Inventory. Educational and Psychological Measurement, 46, 753-760.

Singleton, W. T. (1983). Age, skill, and management. International Journal on Aging and Human Development, 17(1), 15-23.

Slater, R., & Kingsley, S. (1976). Predicting age-prejudiced employers: A British pilot study. Industrial Gerontology, 3(2), 121-128.

Slotterback, C. S. (1996). Projections of aging: Impact of generational differences and the aging process on perceptions of adults. Psychology and Aging, 11(3), 552-559.

Slotterback, C. S., & Saarnio, D. A. (1996). Attitudes toward older adults reported by young adults: Variations based on attitudinal task and attribute categories. Psychology and Aging, 11(4), 563-571.

Snyder, M. (1989). Self-fulfilling stereotypes. In H. J. Leavitt, L. R. Pondy, & D. M. Boje (Eds.), Readings in managerial psychology (4th ed., pp. 195-201). Chicago: University of Chicago Press.

Society for Human Resource Management (1999, November). Political/social trends. Workplace Visions, (6). [On-line]. Available: <http://www.shrm.org/trends/visions/1199d.asp>.

Sonnenfeld, J. (1996). Dealing with the aging work force. In M. C. Gentile (Ed.), Differences that work: Organizational excellence through diversity (pp. 179-197). Boston: Harvard Business Schools Press.

Sparrow, P. R. (1986). Job performance among older workers. Ageing International, 13(4), 5-6, 22.

Specht, L. B., & Sandlin, P. K. (1991). The differential effects of experiential learning activities and traditional lecture classes in accounting. Simulation & Gaming, 22(2), 196-210.

Sproull, N. L. (1988). Handbook of research methods: A guide for practitioners and students in the social sciences. Metuchen, NJ: The Scarecrow Press.

SPSS, Inc. (1998). SPSS graduate pack version 8.0 for windows. Chicago: SPSS, Inc.

Steinaker, N. W., & Bell, M. R. (1979). The experiential taxonomy: A new approach to teaching and learning. New York: Academic Press.

Steinhauser, S. (1998, July). Age bias: Is your corporate culture in need of an overhaul? HR Magazine. [On-line]. Available: <http://www.shrm.org/hrmagazine/articles0798cov.htm>.

Sterns, H. L., Barrett, G. V., Czaja, S. J., & Barr, J. K. (1994). Issues in work and aging. The Journal of Applied Gerontology, 13(1), 7-19.

Sterns, H. L., & Miklos, S. M. (1995). The aging worker in a changing environment: Organizational and individual issues (Special issue). Journal of Vocational Behavior, 47(3), 248-268.

Sterns, H. L., & Sterns, A. A. (1995). Health and the employment capability of older Americans. In S. A. Bass (Ed.), Older and active: How Americans over 55 are contributing to society (pp. 10-34). New Haven: Yale University Press.

Steuerle, C. E. (1996). Confronting the challenges presented by an aging population. (Statement before the Labor and Human Resources Committee's Subcommittee on Aging, U.S. Senate; May 4, 1996). The Urban Institute [On-line]. Available: <http://www.urban.org/entitlements/aging.htm#author>.

Stokes, B. (1999). The challenge to lead: U.S. global economic responsibilities in the 21st century. New York: Committee for Economic Development.

Sullivan, R. L., Wircenski, J. L., Arnold, S. S., & Sarkees, M. D. (1990). The trainer's guide: A practical manual for the design, delivery, and evaluation of training (Pt 2). Rockville, MD: Aspen.

Tabachnick, B. G., & Fidell, L. S. (1989). Using multivariate statistics (2nd ed.). New York: HarperCollins.

Taylor, S. (1989). The aging of America. Training & Development Journal, 43(10), 44-50.

Tenopyr, M.L. (1988). Artifactual reliability of forced-choice scales. Journal of Applied Psychology, 73(4), 749-751.

Thatcher, D.C. (1990). Promoting learning through games and simulations (Special issue: In memory of Donald C. Thatcher). Simulation & Gaming, 21 (3), 262-273.

ThirdAge. (March 6 ,1998). Do you face age bias? In ThirdAge News & Opinion (Story 2 of 7). [On-line]. Available: <http://www.thirdage.com/news/archive/980306-02.html>.

ThirdAge. (June 23, 1998). Older workers: Job market of the future. In ThirdAge News & Opinion (Story 1 of 7). [On-line]. Available: <http://www.thirdage.com/news/archive/980623-01.html>.

ThirdAge. (June 26,1998). Boomers facing generational battle. In ThirdAge News & Opinion (Story 4 of 5). [On-line]. Available: <http://www.thirdage.com/news/archive/980626-04.html>.

Thomas, W. C. (1981). The expectation gap and the stereotype of the stereotype: Images of old people. The Gerontologist, 21(4), 402-407.

Thornburg, L. (1995, February). The age wave hits: What older workers want and need. HR Magazine, 40(2), 40-45.

Thorson, J. A., & Perkins, M. L. (1981). An examination of personality and demographic factors on attitudes toward old people. International Journal of Aging and Human Development, 12(2), 139-148.

Tiemann, K. A., & Stone, M. D. (1992). Projective aging: An engaging technique for teaching issues in growing older. Educational Gerontology, 18(6), 645-649.

Trochim, W. M. K. (1997). The knowledge base: An online research methods textbook [On-line]. Available: <http://trochim.human.cornell.edu/kb/kbhome.htm>.

Trochim, W. M. K. & Land, D. (1982). Designing designs for research. The Researcher, 1, pp.1-6. [Reprint On-line]. Available: <http://trochim.human.cornell.edu/kb/desdes.htm>.

Tucker, F. D. (1985). A study of the training needs of older workers: Implications for human resource development planning. Public Personnel Management Journal, 14, 85-95.

Tuckman, J., & Lorge, I. (1953a). When aging begins and stereotypes about aging. Journal of Gerontology, 8(4), 489-491.

Tuckman, J., & Lorge, I. (1953b). When does old age begin and a worker become old? Journal of Gerontology, 8(4), 483-488.

Tuckman, J., & Lorge, I. (1958). The projection of personal symptom into stereotype about aging. Journal of Gerontology, 13(1), 70-73.

The Urban Institute. (1998, May). Policy challenges posed by the aging of America [On-line]. Available: <http://www.urban.org/health/oldpol.html>

U.S. Congress, Office of Technology Assessment. (1990, September). Worker training: Competing in the new international economy (Report No. OTA-ITE-457). Washington, DC: U.S. Government Printing Office.

U.S. General Accounting Office. (1995). Workforce reductions: Downsizing strategies used in selected organizations (GAO Publication No. GGD-95-54). Washington, D.C.: General Government Division.

Useem, M. (1997). Corporate education and training. In C. Kaysen (Ed.), The American corporation today: Examining the questions of power and efficiency at the century's end (pp. 292 -326). New York: Oxford University Press.

Wallace, P. (1999). Agequake: Riding the demographic rollercoaster shaking business, finance and our world. London: Nicholas Brealey Publishing.

Walsh, J. (1995). Mastering diversity: Managing for success under ADA and other anti-discriminatory laws. Santa Monica, CA: Merritt.

Walter, G. A., & Marks, S. E. (1981). Experiential learning and change: Theory, design and practice. New York: Wiley.

Wehrenberg, S. B. (1986). Simulations: Capturing the experience of the real thing. Personnel Journal, 65, 101-104.

Welford, A. T. (1987). Retraining and plasticity. In G.L. Maddox (Editor-in-Chief), The encyclopedia of aging (pp.585-586). New York: Springer.

Wilkinson, J. (January 2, 1997). Working with different age groups: Generations w, x, and y on the job. In Work/Life, Women's Connection Online [On-line]. Available: http://www.womenconnect.com/info/worklife/features/jan0297_wrkf.htm.

Williams, J. (1985). Into aging: A simulation game. In J.D. Cook (Guest Ed.), Activities, adaptation & aging: Innovations in activities for the elderly, 6(3), pp. 13-15.

Willis, S. L., & Schaie, K. W. (January 28, 1998). Cognitive training in the normal aging brain: A synopsis of the paper by Sherry L. Willis and K.W. Schaie, which appears as a chapter in the book, Cerebral plasticity in human aging. In National Institute on Aging Research Bulletin [On-line]. Available: <http://www.nih.gov:80/nia/new/press/cognitiv.htm>.

Zemke, R. (1984). Bias toward youth called training failure. In P.G. Jones (Sr. Ed.) (Training Today), Training, 21, 74-75.

Zemke, R., Raines, C., & Filipczak, B. (2000). Generations at work: Managing the clash of veterans, boomers, xers and nexters in your workplace. New York: American Management Association.

Zeplin, H., Sills, R. A., & Heath, M. W. (1987). Is age becoming irrelevant? An exploratory study of perceived age norms. International Journal on Aging and Human Development, 24(4), 241-256.